

AIR PARITY:
RE-DISCOVERING CONTESTED AIR OPERATIONS

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APPROVAL

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DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.



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ABSTRACT

This study researches the applicability of Julian Corbett's maritime theories to war fighting strategy in the air domain, specific to the air control spectrum. The author assesses the importance of translating the theoretical ideas to guidelines for operational planners confronted with a possible conflict in the Western Pacific Theater. In particular, this thesis looks at the principles of dispersion and concentration, strategic defense with active tactical offensive lines of effort, and the "fleet in being" concept. The author uses an operational design framework as a means to investigate three cases as they relate to air control. These case studies are the Battle of Britain, the Siege of Malta during World War II (WWII), and the Falklands War. Each of these case studies features a numerically inferior opponent who prevailed. The results of this inquiry suggest some of Corbett's ideas translate into the air domain, and while not explicitly stated by the British, were nevertheless employed by them in their three victories. The thesis concludes with proposals for intermediate air superiority objectives at the outbreak of a conflict with China in the East or South China Seas, and recommendations for employment methods to gain strategic objectives while being inferior in numbers or technology.



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Introduction

In the course of the war, provided we employ correct military and political tactics, make no mistakes of principle and exert our best efforts, the enemy's disadvantages and China's advantages will both grow as the war is drawn out, with the inevitable result that there will be a continual change in the difference in comparative strength and hence in the relative position of the two sides. When a new stage is reached, a great change will take place in the balance of forces, resulting in the enemy's defeat and our victory.

Mao Tse-Tung

The rise of China has significant national security implications for the United States. Although the US should avoid conflict at all costs, US commanders and military planners responsible for the Western Pacific do not have the luxury of being unprepared if the violent conflict were to break out. The Air Force's procurement scheme, a legacy of the Cold War, creates significant challenges in force development to address future threats such as a rising China: "our most challenging scenario is in increasingly contested environments where gaining and maintaining air and space superiority will be our toughest mission – and our highest priority. While success in this environment cannot be at the expense of all lower-end capabilities, our unique and indispensable contribution requires that we posture for the most demanding scenario, not necessarily the most likely."¹ The potential violent conflict between the United States and China, *that should be avoided*, is of sufficient possibility and significant severity that military commanders and planners must devise a way to defeat China should it occur.²

From a strictly numerical standpoint, the US is and will continue to be an inferior force in the Western Pacific. The Department of Defense's (DoD's) 2015 China Military Power Report to Congress states this fact. The People's Liberation Army's (PLA) Second Artillery Force, for example, possesses at least

¹ US Department of the Air Force, *America's Air Force: A Call to the Future* (Washington, DC, 2014), 16.

² For more information behind the potential for rising regional hegemonic conflict see Robert Jervis' discussion of the spiral model. Jervis, Robert. *Perception and Misperception in International Politics*. (Princeton: Princeton University Press, 1976), 64-65.

1,200 short-range ballistic missiles (SRBMs) and medium-range ballistic missiles (MRBMs). The PLA Navy is the largest in Asia, with more than 300 surface ships, submarines, amphibious ships, and patrol craft. By 2020, its submarine force will likely grow to between 69 and 78 submarines. The PLA Air Force (PLAAF) is the third largest in the world with more than 2,800 total aircraft, not including unmanned aerial vehicles (UAV), with more than 2,100 combat aircraft including fighters, bombers, fighter-attack and attack aircraft.³

When comparing total numbers, the United States (US) appears to have the advantage but this is misleading. Unlike China, the United States divides its forces across the globe. China, in contrast, concentrates its forces for homeland defense and regional power projection. Unlike previous conflicts, such as Operation DESERT STORM, Chinese leaders are unlikely to provide the US with the time to build up its forces.⁴ Therefore, at the outbreak of any future hostilities, the US is likely to be inferior numerically in the Western Pacific.

Operational Context

There are many arguments for and against armed future conflict with China. These arguments, while speculative and interesting, are beyond the scope of this thesis.⁵ From the perspective of the operational planner and warfighter, the probability of war with China is not a consideration, but how you fight and accomplish strategic end states is. Chinese theorists and planners understand how the US projects its power. As a result, they are investing in a number of anti-access/area-denial (A2/AD) capabilities. Several US documents describe these capabilities and the challenges they present. For example, the DoD AirSea Battle Office describes anti-access (A2) capabilities as

³ Office of the Secretary of Defense, Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2015, RefID: D-117FA69 (2015), 9-11.

⁴ For an explanation of the military build-up allowed by Saddam Hussein see Perry, William J., "Desert Storm and Deterrence," *Foreign Affairs* 70, no. 4 (Fall, 1991), <https://www.foreignaffairs.org/articles/iraq/1991-09-01/desert-storm-and-deterrence>

⁵ These arguments include economic interdependence of China and the US. Prior to World War I, great power war was inconceivable to many for the same reason. For details, see Tuchman, Barbara. *The Guns of August*. (New York: Ballantine Books, 1962), 11.

“those associated with denying access to major fixed-point targets, especially large forward bases, while area-denial (AD) capabilities are those that threaten mobile targets over an area of operations, principally maritime forces, to include those beyond the littorals.”⁶ The PLA, PLA Navy, and PLAAF have designed specific weapons systems to target objects as large as runways and as small as unmanned aerial vehicles (UAVs) to both degrade and destroy assets in the theater of operations and deny entry to US reinforcements. According to one AirSea Battle Office document, the Chinese will attempt to “deny the United States operational sanctuary in space, threaten all US operating bases in the Western Pacific, including those in Japan, with persistent ballistic and cruise missile attacks, threaten major US Navy surface forces out to 1,200 nm, thereby pushing aircraft carriers far beyond the maximum unrefueled ranges of their current and projected strike aircraft, [and] contest US air operations over or near mainland China and adjacent allied territory.”⁷ In the realm of airpower, the US Air Force will face an advanced Chinese Integrated Air Defense System (IADS) with what the AirSea Battle document describes as “hardened, buried and redundant C2 networks coupled with counter-stealth radar, and increasing numbers of high-end SAMs and fourth/fifth-generation fighters.”⁸ The Chinese rationale for A2/AD systems is simple: “Events of recent decades have demonstrated the decisive results U.S. joint forces can achieve when allowed to flow combat power into an operational area unimpeded.”⁹ China wishes to deny the US its ability to wield military power within the region in the ways it has in the past.

Political End States

Every sound operational plan starts with an understanding of end states on both sides and the differences between what each is trying to accomplish.¹⁰ Most planners will start by trying to answer three questions: what ends are we

⁶ Van Tol, Jan, et al., “AirSea Battle: A Point-of-Departure Operational Concept,” Center for Strategic and Budgetary Assessments (2010), 1.

⁷ AirSea Battle, 19.

⁸ AirSea Battle, 20.

⁹ US Department of Defense, *Joint Operational Access Concept*, (Washington DC, 2012), ii.

¹⁰ Reilly, Jefferey M. *Operational Design: Distilling Clarity from Complexity for Decisive Action*, (Maxwell AFB: Air University Press, 2012), 9.

attempting to meet, what is the enemy's desired end state, and what are the differences between them. No matter what the scenario, the US goal will remain the same: assure access to and within the Western Pacific.¹¹ Joint forces must have sufficient capabilities to assure access and operate in and defeat A2/AD systems. The Secretary of Defense adds that acquiring such capabilities has additional benefits: "In order to credibly deter potential adversaries and to prevent them from achieving their objectives, the United States must maintain its ability to project power in areas in which our access and freedom to operate are challenged."¹² This statement implies the capabilities to defeat A2/AD systems can have a deterrent effect as well. What is clear from the Secretary of Defense's statement and other DoD documents is that senior US leaders expect joint forces to conduct operations successfully within an A2/AD environment.¹³

It would appear from perceived Chinese intentions and writings that they claim, at least in part, areas in the East and South China Seas that the United States recognizes as international waters and traverses regularly. Chinese leaders have suggested they can and will use force to uphold their claims. For example, Chinese writings referenced in the AirSea Battle document have stressed a willingness to employ "large-scale preemptive attacks designed to inflict severe damage on US forces based or operating in the WPTO [Western Pacific Theater of Operations], keep other US air and naval forces well out of range or unable to penetrate into the homeland, disrupt US command and control (C2) networks, and heavily constrain US operational logistics by destroying major supply nodes and the relatively few US logistics ships."¹⁴ With stated and observed Chinese willingness to use military assets to defend claims, and vital US national interests in preserving access to the region, conflict between the two may be a foregone conclusion. No matter what the scenario, such as a Chinese invasion of Taiwan, US military commanders and planners should prepare operational approaches to survive and operate in an A2/AD environment. One of the critical enabling lines of effort to accomplish strategic

¹¹ National Security Strategy, 12.

¹² Office of the Secretary of Defense, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (2012), 4.

¹³ Office of the Chairman, Joint Chiefs of Staff, *The National Military Strategy of the United States of America 2015*, (2015), 11.

¹⁴ AirSea Battle, xii.

military objectives is air superiority. Air superiority has been an enabling line of effort, and usually one of the first operational priorities, in every conflict in which involved the United States since World War I.

This thesis focuses on the spectrum of air control (of which air superiority is one step) needed in a potential conflict with China, the problems faced in trying to gain air superiority against a numerically superior opponent at the outbreak of hostilities, and the theoretical concepts and ideas military commanders and planners might reference to guide planning for such a conflict.

Air Control

Air superiority will be one of the first missions, and a major line of effort, in a potential conflict with China in the Western Pacific. This core mission accomplishes a critical enabling function to support follow-on missions and attainment of overall objectives. Joint doctrine publications describe both the priority of counterair operations and the need for some level of air control. For example, joint doctrine on operations states, “Historically, air superiority has proven to be a prerequisite to success for an operation/campaign because it prevents enemy air and missile threats from interfering with operations of friendly air, land, maritime, space, and special operations forces, assuring freedom of action and movement. Counterair operations usually begin early in the conduct of a campaign to produce the desired degree of air superiority at the times and places chosen by the [Joint Force Commander].”¹⁵ Air Force doctrine mirrors joint doctrine but adds the generic order in which to find the air-superiority line of effort: “Control of the air is normally one of the first priorities of the joint force. This is especially so whenever the enemy is capable of threatening friendly forces from the air or inhibiting a joint force commander’s (JFC’s) ability to conduct operations.”¹⁶ The A2/AD forces China employs will present a significant problem for gaining and maintaining air superiority. As such, deciding on and establishing the level of air control

¹⁵ US Department of Defense, *Joint Publication 3-0: Joint Operations*, (Washington DC: 2011), I-2.

¹⁶ US Department of the Air Force, *AF Doctrine Annex 3-01 – Introduction to Counter Air Operations*, (Washington DC: 2015), 1.

required to accomplish follow-on objectives will be one of the first priorities for commanders in a Western Pacific campaign.

Air Force doctrine discusses various levels of air control. It identifies three specific levels: parity, superiority, or supremacy.¹⁷ These three levels of air control, which apply to both belligerents in the conflict, describe the capability to prevent “prohibitive or effective interference to joint forces in the air domain from enemy forces, which would prevent joint forces from creating their desired effects.”¹⁸ The level of air control described by air supremacy is most desirable; it would prevent *effective* enemy interference. Effective interference does not imply the absence, rather such interference is “so negligible as to have little or no effect on operations.”¹⁹ Air *superiority*, on the other hand, is a lower level of air control, but still describes an environment with “sufficient freedom of action to create desired effects” by any other joint operations.²⁰ Joint doctrine recommends that at the outset of hostilities, the Joint Force Commander decide on the degree of air control required to attain his follow-on objectives.²¹ Describing and conducting counter-air missions at the outset of a conflict, to establish the level of air control the Joint Force desires is important. The highest level of air control the United States could hope to attain in a conflict in the Western Pacific is air supremacy. Air supremacy, however, is unlikely given the Chinese advantage in numbers. Air superiority is the level of control Pacific forces should strive for, but even this will be challenging throughout the conflict.

Air Force and Joint doctrine further qualify levels of air control by time and space. Joint Publication 3-30 recognizes control of the air localized over a specific area or over the entire operational area. Joint Publication 3-30 also acknowledges that control of the air may vary over time.²² Air Force doctrine also identifies in Annex 3-01 *Counterair Operations: Planning Considerations*, that the Joint Force Air Component Commander’s (JFACC) first priority “should

¹⁷ US Department of the Air Force, *AF Doctrine Annex 3-01 – Counter Air Operations*, (Washington DC: 2016), 1.

¹⁸ AF Doctrine Annex 3-01 – Counter Air Operations, 1.

¹⁹ AF Doctrine Annex 3-01 – Counter Air Operations, 1-2.

²⁰ AF Doctrine Annex 3-01 – Counter Air Operations, 1-2.

²¹ Joint Publication 3-01, xv.

²² US Department of Defense, *Joint Publication 3-30: Command and Control of Joint Air Operations* (Washington DC: 2014), I-1.

be to define—in both time and space—that level of control of the air needed to achieve” the Joint Force Commander’s (JFC) objectives.²³ From joint and Air Force doctrine then, the JFC and JFACC should define for operational planners the level of air control needed at the time and the place specified.

In the Western Pacific Theater of Operations (WPTO), the A2/AD environment directly counters the air control desires of the JFC and JFACC. This environment reduces the time and space possible to achieve air superiority. In addition, at the opening of a conflict with China, the US is not likely to possess the numbers required to achieve the enduring air superiority over large portions of the joint operational area, as has been enjoyed in recent conflicts. Referring to the underpinning theories and historical cases that form the basis of doctrine, leads to additional material for JFCs and JFACCs to draw upon when deciding on the time and space actually needed for air superiority.

The scope of this thesis is the air control insights from the theory and historical case studies similar in broad characteristics to those the US might face in the Western Pacific. A2/AD environments, for example, are not new. In many respects, this term reintroduces the old concept of contested operations. Even the concept of contested operations is not new. For a number of reasons, however, the United States military has operated with sustained air supremacy in the Middle Eastern Theater for so long that contested air operations appear quaint or even foreign to contemporary planners. This context does not repeat in the WPTO. Recent joint and Air Force doctrine re-writes have tried to emphasize the geographical and temporal aspects of air control. The case analysis details historical example that adds flesh to the concepts of air control when not sustained in time and theater wide in area.

Theory - Air Superiority in the A2/AD Environment

The two theories from which the greatest insights for future conflict in the Western Pacific derive are maritime ones, and more specifically, the theories of Alfred T. Mahan and Sir Julian Corbett. The obvious question is why air planners should look to maritime power theorists for solutions to air domain

²³ US Department of the Air Force, *AF Doctrine Annex 3-01 – Counter Air Operations: Planning Considerations*, (Washington DC: 2015), 1.

problems. There are two compelling answers. First, early airpower theorists such as William “Billy” Mitchell and Giulio Douhet offer theories in a domain similar to the maritime one in that they view it as a commons. Both air and maritime theories see their domain as comprised of international zones and shared spaces. In addition, all identify the inability to occupy permanently their domain as a key attribute. The second answer is the basis of the theories. The ideas of Mitchell and Douhet ring similar to those of Alfred Mahan. Mitchell and Douhet discussed control of their domain extensively. Their ideas concerning operations in a global common are similar to Mahan’s when describing the necessary steps to take control of that domain.

Mahan sought “command of the sea.” He thought the most effective method of gaining command was to engage the enemy’s fleet.²⁴ Mahan further opined that to gain command of the sea, one should not divide the fleet because in the battle with the enemy fleet one would need the maximum concentrated offensive firepower possible.²⁵ Mahan’s concept of “command of the sea” included a temporal dimension as well. He suggested, “If naval superiority is to be maintained, the enemy’s navy must be crushed,” that meant more than one engagement, if necessary.²⁶ Great navies exercised command of the sea by driving other navies from it.

Mitchell and Douhet shared Mahan’s idea that control is best accomplished through the destruction of the other fleet.²⁷ Douhet believed there was “no practical way to prevent the enemy from attacking us with his air force except to destroy his air power before he has a chance to strike at us.”²⁸ He saw other similarities to naval warfare: “coastlines are defended from naval attacks, not by dispersing ships and guns along their whole extent, but by conquering the command of the seas; that is, by preventing the enemy from

²⁴ Crowl, Phillip A. “Alfred Thayer Mahan: The Naval Historian,” in *Makers of Modern Strategy*, (Princeton: Princeton University Press, 1986): 444-447, 458.

²⁵ Crowl, 458.

²⁶ Mahan, Alfred T. *The Influence of Sea Power Upon History 1660-1783*, (New York: Cosimo Classics, 2007), 373.

²⁷ Both Mitchell and Douhet believed in destruction of the enemy fleet but differed in tactics to accomplish this objective. Douhet would champion attacking enemy air forces while on the ground. While Mitchell saw benefits to this tactic, he pushed for engagement of the enemy in the air.

²⁸ Douhet, Giulio. *The Command of the Air*, ed. Joseph P. Harahan and Richard H. Kohn. (Tuscaloosa: The University of Alabama Press, 2009), 18.

navigating. The surface of the earth is the coastline of the air.”²⁹ Douhet sought “command of the air” by preventing the enemy from flying.³⁰ Later experience demonstrated that large masses of air fleets could meet in the air and destroy each other in aerial combat as well, thereby supporting Mitchell’s air control theory. Despite this experience, the underlying principle from theory did not change once enshrined in doctrine: the goal remains the destruction of the enemy’s fleet to gain control of the air. The theories offered by Mitchell and Douhet, as derivatives of Mahan, imply a sustained temporal aspect to control of the air, and closely resemble the goal of air supremacy. As discussed above, in the WPTO this level of air control might be unattainable.

Such theories of the air domain lack of a counter point to decisive battle among air fleets. A Mahanian lens, as a result, potentially influences the theories and doctrine that guide planners, which is potentially disastrous in an A2/AD environment. The airpower theories of Mitchell and Douhet, for example, led to of the use of mass-formation warfare as experienced in World War II. This style of warfighting however led to an overall air campaign based on attrition, generating more aircraft than the enemy does. The US Air Force cannot count on numerical superiority or the political willingness to sustain significant losses over time in a potential showdown with the Chinese. Political restrictions could even restrict attacks on the PLAAF while at their mainland Chinese locations. Stated above, doctrine recommends control of the air as one of the first priorities of the joint force. However, control of the air by driving the PLAAF from it may not be possible, and air superiority as a sustained step may not be the actual level of air control required to continue other lines of effort. The theories of Douhet in the air domain lack the separate view of a Julian Corbett, as Mahan experienced in the maritime domain. In addition, the theory of Corbett better explains the temporal and geographical limitations on air superiority that doctrines try to communicate.

In the Chinese A2/AD environment, command of the sea or command of the air as envisioned by Mahan or Douhet is not immediately possible for the

²⁹ Douhet, 19.

³⁰ Douhet, 19.

US.³¹ First, the possession of a “great navy,” or in the US Air Force’s case an air fleet, is precisely what the A2/AD environment seeks to prevent. The A2 part of the equation aims to prevent the United States and its allies from deploying forces to the region to maintain the regional numerical advantage the Chinese enjoy. Second, the area denial portion of the A2/AD strategy seeks to destroy and then at least deny forces and their capability to carry out missions in theater. Airborne allied forces might survive the initial attacks but aircraft must land eventually. When they do, the concentration of such forces then creates lucrative targets which the Chinese missile inventory appears more than capable of destroying. US political constraints might deny Air Force operations over mainland China that would be necessary to “even the playing field,” placing US forces at a distinct disadvantage. All of these factors undermine the theoretical basis of Mahan or Douhet’s ideas as an interpretation to US strategy.

The writings of Julian Corbett offer a different perspective on command of a domain. He envisions command of the sea in the following way: “the object of naval warfare must always be directly or indirectly either to secure the command of the sea or to prevent the enemy from securing it.”³² To think that because one could not gain command of the sea, “we should therefore be too weak to prevent the enemy getting it,” is in his mind a negation of theory and of “practical experience.”³³ If the US and its allies cannot achieve immediate and sustained air superiority, to the extent joint forces have come to expect, allied forces should be at least capable of denying it to the PLAAF.

Corbett’s theoretical writings offer other insights as well. Even if the Air Force cannot destroy the PLAAF, its forces are not automatically ineffective. Corbett develops the idea of a “fleet in being”:

[Another] group [of] operations [occurs] when our relative strength is not adequate for either class of operations to secure command. In these conditions we have to content ourselves with endeavoring to hold the command in

³¹ For example, complete destruction of the PLAAF through numerical superiority.

³² Corbett, Julian S. *Some Principles of Maritime Strategy*, ed. John B. Hattendorf and Wayne P. Hughes (Annapolis: Naval Institute Press, 1988), 91.

³³ Corbett, 92.

dispute; that is, we endeavor by active defense operations to prevent the enemy either securing or exercising control for the objects he has in view. Such are the operations which are connoted by the true conception of 'a fleet in being.' Under this [heading] also should fall those new forms of minor counter-attack which have entered the field of strategy since the introduction of the mobile torpedo and offensive mining.³⁴

Corbett's ideas suggest US airpower might overcome numerical inferiority through a combination of strategic defensive with tactical offenses. This concept of operations is explored throughout the thesis.

According to Corbett's ideas, the US Air Force should also be able to challenge the PLAAF methods of *exercising* command of the air in the Western Pacific Theater. Corbett explains further in terms of maritime operations: "These operations... will be found to take one of three general forms. Firstly, the control of the lines of passage of an invading army; secondly, the control of trade routes and trade terminals for the attack and defense of commerce; and thirdly, the control of passage and communication for our own overseas expeditions."³⁵ Based on these ideas, a joint force can still use air power in theater to affect the exercise of control even if those assets cannot gain command of the air by destroying the enemy fleet. Corbett also offers a counterpoint to Mahan's principle of never dividing the fleet. In naval theory, concentration is not necessarily the sole object; concentration on the sea "meant the possibility of massing at the right time and place. It meant... the disposal of squadrons about a strategical [center] from which fleets could condense for massed action in any required direction, and upon which they could fall back when unduly pressed."³⁶ For similar reasons, air power does not need to be concentrated when not being used (on the ground), but when massing at the right time and place to create concentrated firepower. Corbett suggests the degree of division "is in proportion to the number of naval ports from which the enemy can act against our maritime interests and to the extent of coastline along which they are spread."³⁷ Dispersal of forces, therefore, is not

³⁴ Corbett, 165.

³⁵ Corbett, 165.

³⁶ Corbett, 144.

³⁷ Corbett, 151.

a new concept, but retaining the ability to operate with and quickly concentrate from dispersed locations lacks attention.

Solution and Aim

Based on the preceding discussion, the purpose of the thesis is to provide commanders and military planners additional insights from theory and history to address the challenges of future air war in the Western Pacific region. Current Joint and Air Force doctrine blends both Mahanian and Corbettian theory to guide commanders in the air control line of effort. However, recent conflicts lead current planners to associate different meaning to the temporal and geographical limitations described in that doctrine. Planners must guard against associating air superiority defined in space and time, with the recent air supremacy friendly forces enjoyed. The author hypothesizes that Corbett's ideas, as opposed to Mahan, may inform more effective operational approaches in the opening stages of a war in the Western Pacific. A comparative case study approach evaluates this hypothesis. The author examines three historical case studies—the Battle of Britain (1940), the Siege of Malta (1941-42), and the Falklands War (1982)—to assess the degree to which Corbett's ideas have utility in the air domain as they relate to the basis of doctrine. All three case studies involve power projection in a contested maritime and air environment, and feature one side fighting at a numerical disadvantage.

Limitations

There are four main limitations with the research. First, the author assumes deterrence has failed in the Western Pacific. While preparing forces along the lines of an operational approach suggested in this thesis might deter aggressive action from China (and reasonably should), the priority is to prepare forces for hostilities. Posturing solely for deterrence could drive different priorities. Second, this thesis does not explore a comprehensive joint operational approach. While a future war with China can and should be joint, the author's intention is to focus specifically on a US Air Force operational approach to present survivable and capable airpower to the joint commander that can accomplish core missions. As a result, the case study analysis focuses

on lessons applicable to air operations. References to air control, however, do refer to all assets capable of assisting in that goal.³⁸ Third, this study analyzes only one required mission set for the Air Force, counterair. While air superiority along the air control spectrum is a crucial enabler for other missions, this thesis does not discuss Intelligence Surveillance and Reconnaissance (ISR) and mobility considerations. Suppression/Destruction of Enemy Air Defenses (SEAD/DEAD) surfaces only as the mission relates to counterair. Finally, this research does not incorporate coalition or Allied considerations. From these limitations, this thesis now turns to discuss the framework to evaluate the three case studies.



³⁸ These assets include, for instance, naval air apportioned to an Air Force JFACC or Patriot batteries apportioned to the Area Air Defense Commander.

Chapter 1

Case Selection and Comparative Criteria

Air superiority in an A2/AD environment imposes different considerations than other Air Force missions. As a result, the contested air and maritime dominated environments allow for distinctive historical case selection. This chapter serves two purposes. First, it outlines selection of the three case studies. Next, the chapter outlines the criteria that form the basis for the approach to operational planning and design developed by Dr. Jeffrey Reilly.³⁹ These criteria subsequently form the basis for analysis of the case studies.

Case Selection

Reasoning by historical analogy can be problematic. Yuen Foong Khong, for example, warns of “poor use” when using historical analogy in his book *Analogies at War*. Policymakers tend to pick the first analogy that comes to mind. In addition, other poor use includes failing to search for and to seriously consider other parallels, neglecting potentially significant differences between situations compared, and using analogies as substitutes for proof.⁴⁰ Ideas brought about by surface level similarities must be couched in a discussion of how their contexts are potentially different, and the effects of those differences. Khong also offers how historical analogies are useful as intellectual devices to assist in “diagnostic tasks relevant to political decision making.”⁴¹ Analogies are cognitive devices that “help” policy makers perform six diagnostic tasks central to decision-making:

- 1) they help define the situation confronting the policy maker;
- 2) they help assess the stakes;
- 3) they indicate possible solutions;
- 4) they evaluate alternative options by predicting their chances of success;

³⁹ Reilly asserts an operational design system ““is not just providing a mechanism to construct a campaign plan. Its true value rests in its fundamental capability to facilitate decision making.” *Operational Design: Distilling Clarity from Complexity for Decisive Action*, (Maxwell AFB: Air University Press, 2012), xi.

⁴⁰ Khong, Yuen Foong. *Analogies at War*. (Princeton: Princeton University Press, 1992), 30.

⁴¹ Khong, 20.

- 5) they help evaluate alternatives' moral rightness; and
- 6) they help warn about dangers with the associated options.⁴²

This thesis attempts to perform the same functions for military decision makers. The author seeks to transition from surface level analogy to in-depth case analysis not to fall prey to the potential pitfalls described by Khong.

To avoid these pitfalls, this thesis uses four criteria to narrow the considerable field of potential historical cases. These criteria help select case studies with important similarities that affect specific military considerations for operations in the Western Pacific Theater. The criteria developed by the author for case selection are: strategic military objectives; initial numerical disparity in the forces available; force projection and sustainment obstacles; and, a predominance of activity in the air and maritime domains.

For the sake of brevity, this chapter uses Sam Tangredi's terminology from his book *Anti-Access Warfare* to describe the sides in the conflict. The anti-access force, for example, is the one looking to seize local control and use technologies and an anti-access strategy to destroy enemy forces in theater and prevent their reconstitution. The counter anti-access force is the one conducting operations with assets in theater and looking to inject more assets into the theater of operations.⁴³

Before continuing with the case study selection criteria, it is necessary to define a key term related to it: force projection. The Department of Defense Dictionary of Military Terms, contained in Joint Publication 1-02, defines force projection as "the ability to project the military instrument of national power from the United States or another theater, in response to requirements for military operations."⁴⁴ Force projection is apparent in two of the three examples but not in the Battle of Britain. The actual geographical distance forces travel is important only to the extent it affects military operations. The difficulties in force projection often lead to a shortage of assets, reconstitution difficulties, and sustainment problems for the force in theater. Two of the three cases

⁴² Khong, 20-21

⁴³ Tangredi, Sam J. *Anti-Access Warfare: Countering A2/AD Strategies*, (Annapolis: Naval Institute Press, 2013), 4-5.

⁴⁴ US Department of Defense, *Joint Publication 1-02: Department of Defense Dictionary of Military and Associated Terms*, (Washington DC: 2016), 90.

described conform to the traditional cause of force projection problems—geographic distance—but the Battle of Britain does not. All three are similar, however, in the effects force projection entails—shortage of assets and the creation of sustainment issues in theater.

Battle of Britain

The Battle of Britain conforms to all four criteria based on the preceding discussion. The anti-access force is the Germans, and the counter anti-access force is the British. This assignment might seem counter-intuitive. The Germans held potentially similar military objectives potentially to those of the Chinese: gain and maintain control over the adjacent sea and airspace to launch an invasion, deny operations, and degrade/destroy opposing forces in theater. The Germans were attempting these objectives for a potential invasion of Great Britain, and the Chinese might make this attempt as a precursor to invasion or blockade of Taiwan. The Germans also had numerical superiority at the beginning of the campaign, as will the Chinese. Both theaters feature the air and sea domains predominantly. The Germans suffered aircraft range problems, which limited their ability to project force.

The British or counter anti-access force sought survivable operations to maintain air and sea superiority, or, at least, contest it over southern England and the English channel so as to deter a German invasion. On the surface, the British might seem the anti-access force. However, their action might be similar to the situation facing US forces. This action is to contest air and sea superiority to deter Chinese invasion of Taiwan. The British were numerically inferior at the start and the sea and air domains dominate the theater. In terms of force projection, the British would not have sustainment problems but would feel “force projection effects” in sortie availability due to pilot shortage and assets required to conduct adequate strike missions on German bases in Europe.

Siege of Malta

In the second case, the Siege of Malta during World War II, the anti-access force would be the Germans and Italians, and the counter anti-access

force is the British. The Germans, or anti-access force, sought to gain and maintain air and sea superiority over the central Mediterranean Sea to supply their North African invasion and destroy British troops on Malta. The Germans had numerical superiority at the start of the Maltese campaign, and were closer to the area of operations, in terms of force projection, by operating from bases in Italy and North Africa. Finally, the air and maritime domains dominate the theater in question.

The British, the counter anti-access force, sought to maintain, or, at least, contest air and sea superiority in the central Mediterranean to degrade the North African invasion, and conduct survivable operations to link Great Britain with the Eastern Mediterranean and the Suez Canal. The British were numerically inferior at the start, and faced force projection problems from the home islands.

The Falklands War

The third case is the Falklands War. In this case, the anti-access force would be Argentina, and the counter anti-access force would be the British. The Argentinian anti-access force aimed to gain and maintain superiority in the southwest Atlantic Ocean to invade and supply the Falkland Islands. Also, the Argentine junta wanted to destroy British assets on the islands and deny British resupply and intervention in the area. The Argentinians successfully occupied the Falkland Islands and had numerical superiority at the start of the conflict. The Argentinian force projected across only 400 nautical miles (nm) of the ocean, in comparison to significantly larger distances for the British task force. Finally, the air and sea domains dominated the theater of operations.

The counter anti-access force, Great Britain, sought to gain and maintain air and sea superiority over the Falkland Islands chain as a precursor to counter-invasion of the islands. The British were numerically inferior at the start of the campaign but were able to overcome force projection problems and bring their assets to bear. The British would have to force project 7,800nm from the home isles and just under 4,000nm from their staging location, the Ascension Islands. From the selection discussion of the case studies, this thesis turns to the criteria used to evaluate them.

Comparative Criteria

One of the foremost US experts on operational design is Dr. Jeffrey Reilly. Reilly, who teaches at the Air Command and Staff College, has written one of the textbooks on the subject. For these reason this thesis relies on his operational design construct as the methodology to analyze each case study. Reilly identifies the components of design in his book *Operational Design*. This thesis uses only the essential operational elements in both art and design to distill the similarities and differences between the operational approaches in the cases selected.

Reilly identifies eight components of operational design. These components are: end state, objectives, effects, centers of gravity, decisive points, lines of operation/effort, the arrangement of operations, and assumptions.⁴⁵ In addition to the components of design, he suggests there are five elements of operational art. The elements he identifies are: direct vs. indirect approach, operational reach, anticipation, culmination, and forces and functions.⁴⁶

To explore each component and element in its required depth for each of the cases would require a dissertation. Some of the components and elements of his analysis, however, have direct relevance to case studies. By selecting historical cases that resemble contemporary planning problems, various problem framing or operational design elements are redundant and excluded in this thesis. Components necessary for this enquiry include end states, objectives, effects, and centers of gravity, lines of effort, decisive points, and assumptions.

For the purposes of this thesis, the analysis will combine end states, objectives, and effects further. Reilly begins his thoughts on operational design as, “The point of origin for developing an operational approach is an analysis of strategic guidance and a comprehension of the national strategic end state.”⁴⁷ For this analysis, end states will be similar across the cases. This thesis

⁴⁵ Reilly, 27.

⁴⁶ Reilly, 27.

⁴⁷ Reilly, 32.

identifies the end states for each side but does not delve into the reasoning behind them.

Reilly describes objectives as “clearly defined, decisive, and attainable goals toward which every operation is directed.”⁴⁸ Typical objectives are statements similar to – deter country X and if deterrence fails to defend country Y from intervention from country X, or defeat country X’s forces. This thesis focuses on the objective of “defeating forces” given its emphasis on air superiority. The discussion of objectives adds clarity to the understanding of air superiority but only assessed for the degree to which they supported end states.

Reilly identifies effects as “conditions derived from objectives and exist in two forms, desired and undesired.”⁴⁹ As with end states and objectives, each side was concerned with the effect of defeating forces. The one caveat is the undesired effect of escalation. In the Battle of Britain and the Siege of Malta, escalation was not an undesired effect given the context of total war. For these reasons, the case studies only briefly discuss effects. In the Falklands War, however, escalation was an undesired effect that had a direct bearing on operations. As a result, the Falklands War case study discusses the escalation effects element.

The other operational design components necessary for this enquiry include centers of gravity, lines of effort, decisive points, and assumptions. These are the distinctive features of an operational approach detailed for this analysis. Joint publication 3-0 defines Centers of Gravity (COGs) as “the source of power that provides moral or physical strength, freedom of action, or will to act.”⁵⁰ Reilly adds, “assessing the dynamic characteristics of a COG bonds the desired end state, objectives, and effects with the strategy designed to defeat, destroy, neutralize, or protect a COG.”⁵¹ Identification of COGs usually drives a majority of the following planning process, and as such, this thesis delves deeper into the COGs identified of each side. Critical factor analysis provides

⁴⁸ Reilly, 36.

⁴⁹ Reilly, 37.

⁵⁰ US Department of Defense, *Joint Publication 3-0: Joint Operations*, (Washington DC: 2011), GL-6.

⁵¹ Reilly, 40.

further rigor to the assessment of COGs. Critical factor analysis bases on a discussion of critical capabilities, critical requirements, and critical vulnerabilities.⁵²

The next component of operational design is decisive points. Decisive points differ from COGs in that they are geographic places, particular key events, notable actors, or functions “that, when acted upon, allows commanders to gain a marked advantage over an adversary or contribute materially to success.”⁵³ Of the subcategories, Reilly’s “functional decisive points correspond to specific tasks or functions. Illustrations include establishing early warning, gaining air superiority, conducting RSOI, and protecting the force.”⁵⁴ The main functional decisive point of interest here is air superiority.

The next category is lines of effort or lines of operation. Reilly describes how these lines develop: “As JFCs and their staffs evaluate decisive points, they determine the most important ones and designate them as decisive points for the campaign. These designated decisive points become the basis for developing lines of operation (LOO), visualization of a campaign’s concept of operations that link tactical and operational objectives to the end state.”⁵⁵ This thesis focuses specifically on the lines of operation to gain air superiority.

The final operational design element detailed from Reilly’s framework is assumptions. He defines them as “a supposition on the current situation or a presupposition on the future course of events, either or both assumed to be true in the absence of positive proof, necessary to enable the commander in the process of planning to complete an estimate of the situation and make a decision on the course of action.”⁵⁶ Assumptions are important to the case study analysis in that they identify risk to an operation.⁵⁷ Assumption analysis occurs when they caused operations to fail in the case studies.

⁵² Reilly, 42.

⁵³ Reilly, 44.

⁵⁴ Reilly, 44. Reception, Staging, Onward-Movement & Integration [RSOI] - is the process that transitions personnel and equipment arriving in a theater from their packing and traveling configuration and location into operationally viable forces at the deployed locations they will operate.

⁵⁵ Reilly, 47.

⁵⁶ Reilly, 54.

⁵⁷ Reilly, 54.

To sum up the preceding discussion, operational design assists in evaluating case studies by providing a framework for analysis. Rather than merely recounting events, the categories of operational design provide insight into enemy and friendly COGs, the decisive points to affect those COGs, the lines of operation to “win” those decisive points, and critical assumptions that could have, or actually did, led to the success or failure of a campaign. The next section briefly touches on a critical assumption of thesis: conventional as opposed to nuclear conflict between the US and China.

The Nuclear Elephant

This thesis assumes large-scale conventional conflict between two nuclear powers. To ignore a possible conventional conflict with China because of the possibility of a nuclear exchange is a dangerous proposition. While the potential for violence exists, the author assumes neither country will breach the nuclear threshold due to leadership statements from both countries.⁵⁸

Roadmap

With the cases identified and the comparative method described, the thesis continues with the three cases themselves and a conclusion. This chapter covered the comparative criteria used for historical case selection of the three cases, based on Dr. Reilly’s operational design framework. Chapters Two, Three, and Four provide an operational assessment of air control for the Battle of Britain, Siege of Malta during WWII, and the Falklands War respectively. The conclusion synthesizes the similarities and differences in operational approaches between the cases, and compares common themes across the cases. From these themes, the author concludes with several recommendations to operational planners.

⁵⁸ For US statements, see Office of the Press Secretary, “FACT SHEET: Nuclear Weapons Employment Strategy of the United States,” (Washington DC: The White House, June 2013), <https://www.whitehouse.gov/the-press-office/2013/06/19/fact-sheet-nuclear-weapons-employment-strategy-united-states>. For Chinese statements, see Office of the Secretary of Defense, Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2015, RefID: D-117FA69 (2015), 9-11.



Chapter 2

The Battle of Britain

The Battle of Britain is a quintessential underdog victory that ensured the survival of the United Kingdom and allowed it to go on the offensive against Adolf Hitler in World War II (WWII). The Battle of Britain remains a source of considerable interest particularly given the recent 75th-anniversary commemorations. With considerable interest is considerable debate on a range of topics, including exactly when the campaign began and ended. For the purpose of this chapter, the analysis is limited to the period starting in the early summer, June 1940, until the beginning of November 1940. Although the Germans did continue bombing England past this date, the threat of their invasion had passed. As outlined in Chapter One, the operational design framework provides the means to analyze the Battle.

This chapter begins with a general history of the campaign highlighting distinct periods relevant to the analysis. Second, this chapter discusses the end states desired for both sides, the strategic and operational objectives those desired end states drove, and the effects those objectives attempted to create. Third, the chapter identifies the Centers of Gravity (COGs) for both the Germans and the British, and assesses their critical vulnerabilities. Fourth, the chapter discusses what occurred during the campaign by considering both side's lines of operation and their combined decisive points for the campaign. The chapter briefly touches on some of the arrangements of operation, assumptions, and intervening variables before concluding.

General History – Five Phases

A brief history of the Battle of Britain breaks down into five phases. The first phase was the preliminary, or “Channel phase,” from July to early August 1940. The Germans traditionally viewed the next phase as the start of the campaign. This phase was the “Eagle Attack phase” from 13-23 August 1940. This chapter separates the next phase by a limited break in the effort and a change in emphasis in targeting caused mainly by weather. This phase includes what British historians refer to as the “hardest days phase,” from 24

August to 6 September. The fourth phase sees a shift in German strategy and is the opening of “attack on London phase,” 7 September to 31 October. The last phase, which receives brief mention in this chapter, the British refer to as “The Blitz,” lasting 7 September to April/May 1940. For reasons that will become clear, this chapter ends its assessment of the Battle on Britain on 13 November.⁵⁹

The “Channel phase” set the stage for the main actors during the Battle, including the command leadership on both sides and the forces that would participate. The German chain of command started at the top with the Supreme Command of the Armed Forces or *Oberkommando der Wehrmacht* (OKW). OKW included Adolf Hitler, with advisor Generals Wilhelm Keitel and Alfred Jodl, as commander-in-chief. The three German armed services—Army, Navy, and Air Force—reported to them.

Reichsmarschall Hermann Göring and deputy Generalfeldmarschall Erhard Milch commanded the German air force (*Luftwaffe*), a principal component of the Battle, and its High Command.⁶⁰ The *Luftwaffe* would use three air-fleets, or *Luftflotten*, in the campaign. *Luftflotten 2*, in northeast France and Belgium, was under the command of Albert Kesselring. *Luftflotten 3*, in northwest France, was under the command of Hugo Sperrle. *Luftflotten 5*, in Norway and Denmark, was under the command of Hans-Jurgen Stumpff.⁶¹

Opposing the *Luftwaffe* was the Royal Air Force (RAF), and its main defensive element, Fighter Command. Air Chief Marshal Sir Hugh Dowding commanded RAF Fighter Command. In turn, four group commanders were under his command. The four groups were: No. 11 Group in the southeast of England, under Air Vice-Marshal Keith Park; No. 10 Group in the southwest, under Air Vice-Marshal Sir Quintin Brand; No. 12 Group in the Midlands, under Air Vice-Marshal Trafford Leigh-Mallory; and, No. 13 Group covering the North and Scotland, under Air Vice-Marshal Richard Saul.⁶²

⁵⁹ Collier, Basil. *The Defense of the United Kingdom*, (London: Her Majesty’s Stationary Office, 1957), v-vi.

⁶⁰ Bungay, Stephen. *The Most Dangerous Enemy: A History of The Battle of Britain*, (London: Aurum Press Ltd, 2000), 109-110.

⁶¹ Bungay, 119.

⁶² Bungay, 128.

Historians disagree on the exact numbers of aircraft each side would employ in the Battle. Stephen Bungay, for example, pits “48 squadrons of 754 Hurricanes and Spitfires against 1,464 fighters and 1,808 bombers,” of which the Supermarine Spitfires and Hawker Hurricanes would be facing 1,107 Bf 109s.⁶³ Official historian Basil Collier, writing 43 years earlier, limited the German forces in his discussion to *Luftflotten 2* and 3, which were “responsible for the main assault,” and accounts only for their effective airborne strength. By Collier’s estimates, the Germans used 800 long-range bombers, 250 dive-bombers, and 820 fighters against some 600 fighters that Dowding could put in the air at one time.⁶⁴ Historians may continue to disagree about the exact number of aircraft used during the battle; this disagreement is irrelevant for the purpose of this thesis. What matters to the analysis is the British were numerically inferior to the German at the start of the campaign.

The action during the “Channel phase” consisted of German aircraft probing the British defenses and attacking British shipping in the Channel.⁶⁵ In a directive on 30 June, Göring ordered his forces to familiarize themselves with areas of operation, test defenses, and close the Channel to British shipping “as soon as possible.”⁶⁶ Air Marshal Park “had expressly forbidden the interception of pure fighter sorties,” and the Germans had to find targets the British would launch to defend.⁶⁷ The Germans were relatively successful against Channel shipping. As a result, senior Royal Navy leaders canceled all daytime merchant movements through the straits on 26 July.⁶⁸ Most important during this time was the continuous operations planning occurring at *Luftwaffe* headquarters by the staffs of the three *Luftflotten*. These staffs were still laboring on their plans for “the great *Adlerangriff*,” or “Eagle Attack.”⁶⁹ The *Adlerangriff* phase of the attack commenced only a few weeks away.

⁶³ Bungay, 107.

⁶⁴ Collier, 162.

⁶⁵ Richards, Denis. *Royal Air Force 1939-1945: Volume I The Fight at Odds*, (London: Her Majesty’s Stationary Office, 1953), 155.

⁶⁶ Bungay, 147.

⁶⁷ Bungay, 148.

⁶⁸ Bungay, 179.

⁶⁹ Richards, 158.

The second phase, seen by the Germans as the opening of the campaign, was the “Eagle Attack phase.”⁷⁰ This phase saw a significant increase in German sorties, raid size, and targeting of the British mainland, all of which are typical of a campaign’s opening assault phase. During the 24-hour period on 13 August, the Germans would launch 1,485 sorties, with about two-thirds of them being fighters, and Fighter Command would fly 700 daylight sorties and 27 at night.⁷¹ This phase of the Battle of Britain reached its climax on 15 August when *Luftflotte 2* attacked the southeast of England, *Luftflotte 3* the south, and *Luftflotte 5* the northeast.⁷² On this day, the *Luftwaffe* would fly 1,786 sorties, and would lose 75 aircraft, and Fighter Command would lose 34.⁷³ Most of these days repeated in attack numbers and flying conditions, but the phase would end with bad weather – from 19 to 23 August dense cloud cover would not allow the Germans to conduct operations in strength.⁷⁴ This break in the action is important because several meetings of the *Luftwaffe* commanders would happen during this time, resulting in a noticeable shift in targeting emphasis for the next phase.

The third phase of the Battle of Britain, the so-called “hardest days phase” for the British, would open on 24 August and last until 6 September. This phase would show a continued intensification of German activity and a specific targeting of Fighter Command’s infrastructure and assets.⁷⁵ On only one day of this phase —27 August— would the Germans launch fewer than 600 sorties.⁷⁶ On 30 and 31 August, the Germans would launch more than 1,600 sorties.⁷⁷ This phase is critical as the Germans recognized the failure of the Eagle Attack. In response to this failure, the German leadership adjusted their strategy to concentrate their fighters in *Luftflotte 2*, under Kesselring’s command, specifically to target Fighter Command in Park’s section of the

⁷⁰ Richards, 164.

⁷¹ Collier, 188.

⁷² Richards, 166.

⁷³ Collier, 191.

⁷⁴ Richards, 177.

⁷⁵ Bungay, 268.

⁷⁶ Richards, 177.

⁷⁷ Richards, 177.

country.⁷⁸ During this phase, Fighter Command would bear considerable losses.

The fourth phase would come at a precipitous time for Fighter Command. Another shift in targeting strategy occurred with the opening “attacks on London proper phase.”⁷⁹ This phase is important for two reasons. First, it convinced most German leaders “that air superiority was not to be won at all.”⁸⁰ This phase would include Battle of Britain Day, 15 September, which at the time the British believed to be the day Fighter Command shot down 180 German aircraft in defending London.⁸¹ Later estimates would pare that number down to one-third. Second, this phase witnessed a continual shift in German targeting strategy. The lack of German capability to gain air superiority would also force them to reserve bomber use to night operations and shifted the burden of the daylight offensive to their fighters and fighter-bombers.⁸²

The last “serious fling” by the *Luftwaffe* occurred on the final day in September when in the morning eight RAF squadrons turned back a wave of 200 German aircraft over Maidstone and another 100 further west.⁸³ That same day, later in the afternoon, would see two more waves of about 200 aircraft cross into Kent, but they too were broken up.⁸⁴ During this phase “Hitler’s order ‘Nr. 33 255/40 g. Kdos. Chfs’, stated 3 September, fixing S-Day, the launching of Sealion, for 21 September, was postponed until further notice.”⁸⁵ Enigma decryptions of German communications would eventually reveal information of this postponement, and some British historians would draw the end of the attack campaign as 31 October.⁸⁶

There was a fifth and final phase of the attack on the United Kingdom, but this would mainly be a night effort of attack against London. Referred to as “The Blitz,” Kesselring would continue the air war against England over the

⁷⁸ Bungay, 268.

⁷⁹ Richards, 183.

⁸⁰ Collier, 242.

⁸¹ Bungay, 335., Collier, 242.

⁸² Richards, 189.

⁸³ Bungay, 342.

⁸⁴ Bungay, 342.

⁸⁵ Bungay, 336.

⁸⁶ Bungay, 338, 347.

winter of 1940-1941, but would also increasingly assist in the planning for Barbarossa, the assault on Russia. He and *Luftflotte 2* would move from France east in June of 1941.⁸⁷ From here, the analysis delves into the first through fourth phases of the battle.

End State / Objectives / Effects

Prior to and during the Battle of Britain, each side in the campaign had an end state in mind, which drove military strategic and operational objectives. Their specific individual objectives would lead to desired effects, which in turn influenced the end state for which each was looking to achieve. The end state of German policy and “the mission of the Nazi movement” was to “rid the world of Judaism and to conquer living space in Russia.”⁸⁸ Nazi leaders targeted France based on complex and long-standing animosity between the two countries. In addition, Hitler believed if France fell, Great Britain would have no allies on the European continent and would have to negotiate peace.⁸⁹ If Hitler could not negotiate peace, then he at least wanted to neutralize Great Britain so it could not interfere with Germany’s real plans: invasion of Soviet Russia and expansion of the German fatherland East.

To neutralize Great Britain, Hitler had two options: a long siege by air and naval blockade or a quick decision by invasion.⁹⁰ While a siege had a good chance of success, the time it would take to do so would hurt other German plans. At best, Hitler would have to postpone his plans against Russia. At worst, Nazi Germany would face a two-front war.⁹¹ Desirous of a rapid decision, Hitler felt inclined for the invasion of the British Islands to force capitulation and saw establishing air superiority as the prerequisite for its success.⁹² Hitler also hoped that air superiority alone might cause England to negotiate.⁹³ English leaders, on the other hand, saw no room for negotiation.

⁸⁷ Bungay, 363.

⁸⁸ Bungay, 29.

⁸⁹ Bungay, 29.

⁹⁰ Bungay, 32.

⁹¹ Bungay, 32.

⁹² Collier, 177.

⁹³ Bungay, 32.

Churchill saw only one end state that made sense, “victory, victory at all cost, no matter how long and hard the road may be.”⁹⁴

These end states would drive different strategic objectives. As a “best case” scenario, German leaders wished to bring Great Britain to the negotiating table with air power alone, combined with invasion threats. General Jodl, for example, saw three measures to do this: “an intensification of the air war against shipping, the British economy, and the RAF; terror attacks on the civilian population; and the landing of troops.”⁹⁵ German leaders saw the threat of invasion as the expedient “stick” to use and establishing air superiority to enable a crossing made the threat credible.⁹⁶ Air superiority was also necessary for the Germans to offset their naval inferiority to the British.⁹⁷

For Great Britain to achieve victory its leaders, in contrast, saw the need to accomplish three objectives. The first was to ensure Britain’s survival as an independent state.” The second was, “to maintain Britain’s belligerence.” Third and finally, British leaders sought “to secure the United States’ involvement in the war, without which there could be no victory, and with which, ultimate victory was sure.”⁹⁸

The initial operational objective for the leaders of both countries, however, would be similar: gaining or maintaining air superiority. The Germans needed air superiority to cover the invasion, and the British needed at least not to lose air superiority to deter the invasion. The British Chiefs of Staff starkly laid out this logic in their report to Prime Minister Churchill on 25 May: “while the RAF was in existence, the Royal Navy and Air Force in unison probably had the power to prevent seaborne invasion. If, however, the Germans gained air superiority, the Navy would not be able to stop landings ‘for an indefinite period’. Then, German land forces would get ashore, and the British Army would be ‘insufficient to deal with a serious invasion’.”⁹⁹

⁹⁴ Bungay, 15.

⁹⁵ Bungay, 31.

⁹⁶ Collier, 159.

⁹⁷ Collier, 159-160.

⁹⁸ Bungay, 16.

⁹⁹ Ray, John. *The Battle of Britain: New Perspectives*, (London: Brockhampton Press, 1999), 49.

Over the course of the battle, German leadership lost focus on the air superiority objective. The Führer, Adolf Hitler, first issued Directive No. 16 ordering the preparation of a landing operation.¹⁰⁰ This directive would drive the emphasis on the air superiority operational objective already discussed. However, just after Directive No. 16, Hitler disclosed at a conference on 31 July with the Army commander in chief, Walther von Brauchitsch, that he wanted to attack Russia in the same year as well – “the sooner, the better, and preferably this year.”¹⁰¹ This desire would draw resources away from any air campaign still in operation against Great Britain. Even though this desire was only supposed to reach von Brauchitsch and his chief of general staff, Franz Halder, Göring and the *Luftwaffe*’s chief of general staff, Hans Jeschonnek, would unintentionally learn of this comment as well.¹⁰² This started to put the first constraints on the *Luftwaffe* – time. Despite this, Hitler still issued Directive No. 17, which permitted “unrestricted air and sea operations against England as from August 5th.”¹⁰³ Despite the adversary before them across the Channel, German leaders were still preoccupied with plans to invade the Soviet Union.¹⁰⁴ This division of priority would continually affect operational objectives – was Göring to achieve air superiority for the invasion, or to defeat England with air power alone to allow resources for other operations? Both options needed air superiority, but the subtle difference would change targeting plans throughout the battle. Targeting changes would occur from Göring later, at a crucial point during the campaign.

The German air campaign in support of the invasion of England had three stated operational objectives: first, to fulfill a precondition for and make the threat of invasion real by establishing air superiority over the invasion area of South-East England. Second, weaken the RAF to such an extent that Britain would feel vulnerable and, therefore, become more willing to negotiate. Third, begin isolating Britain and weakening her war-making capacity, so that a siege

¹⁰⁰ Bekker, Cajus. *The Luftwaffe War Diaries*, (New York: Doubleday & Company, Inc., 1968), 150.

¹⁰¹ Bekker, 150.

¹⁰² Bekker, 150.

¹⁰³ Wright, Robert. *Dowding and The Battle of Britain*, (London: Macdonald & Co. Ltd, 1969) 155-156.

¹⁰⁴ Bekker, 150.

could begin.¹⁰⁵ For the invasion itself, the *Luftwaffe* would “prevent the RAF from intervening, attack coastal strong points, break initial resistance on the ground and destroy reserves. In addition, it was to disrupt communications and attack British surface vessels before they reached the invasion area.”¹⁰⁶

The diverse nature of these objectives, compounded with the German leadership vacillation on the nature of the campaign discussed above, resulted in several lines of effort for the *Luftwaffe*. Differing lines of effort would cause multiple changes to the targeting plans for the *Luftflotten*, and never receive settlement (our second indication of potential German pitfalls). Directive 17 from Hitler would direct targets as “the flying units, their ground organization and observation apparatus, and the aircraft and radio industry.”¹⁰⁷ They were then “to concentrate on attacking ports”, and as the opportunity arose, attack shipping as well.¹⁰⁸ After the “Eagle Attack”, however, Göring got his *Luftflotten* commanders together and instructed them to target the RAF and industries that supported it.¹⁰⁹ Eventually after another directive on 6 September, targeting again changed to direct attacks on London. The *Luftwaffe*’s objective seemed first to be air superiority, nevertheless, the Germans never decided exactly how to accomplish this aim, and it seems that other objectives and target sets would always show up on the list.¹¹⁰

The effects provided by air superiority were clear for both sides. After the fall of France, the feeling in the German High Command was the war was over and “just a little more force had to be applied to England in order to make her realize it.”¹¹¹ German air superiority over southeastern England would create an environment where German invasion credibility is high, and Great Britain felt vulnerable thereby encouraging negotiation. For the British, Churchill saw resistance as a way to show that Hitler was not invincible, and to encourage the

¹⁰⁵ Bungay, 33.

¹⁰⁶ Bungay, 112.

¹⁰⁷ Bungay, 114.

¹⁰⁸ Bungay, 114.

¹⁰⁹ Richards, 172.

¹¹⁰ Bekker, 150.

¹¹¹ Bungay, 31.

United States to “help a friend in need who was doing his utmost to help himself.”¹¹²

Centers of Gravity / Critical Vulnerabilities

German COG and Critical Vulnerabilities

Both sides had centers of gravity that supported their operations, and both had critical vulnerabilities that would put at risk the air campaign objectives. For the Germans, they enjoyed a distinct advantage in numbers and initiative, specifically where and when to strike. Already discussed was the disparity in numbers. At the start, 754 Hurricanes and Spitfires would duel with 1,464 fighters and 1,808 bombers; and at any one time, 600 British fighters would have to deal with 800 long-range bombers, 250 dive-bombers, and 820 fighters.¹¹³ As for the ground defenses, on 28 July General Sir Frederick Pile, commander of Anti-Aircraft Command, held 1,204 heavy and 581 light anti-aircraft weapons, “one-half of the heavy and less than one-third of the light anti-aircraft weapons considered necessary before the German occupation of the European seaboard.”¹¹⁴ The estimated strength needed to meet the German air threat with its increased production capacity thanks to its occupation of Western Europe was 120 fighter squadrons of 12 aircraft each plus four spares.¹¹⁵ This requirement equated to a front line strength of 1,920 aircraft; but Fighter Command would only have 58 squadrons.¹¹⁶ The other German advantage was the initiative. The *Luftwaffe* could choose the time and place to attack. One of the British COGs, however, would work to shift this balance – the Dowding system gave the British the choice of raids to intercept and in what strength.¹¹⁷

The German use of their numerical superiority was hindered in two ways: time and targeting (the interplay between leadership and Intelligence in

¹¹² Bungay, 16.

¹¹³ Collier, 162., Bungay, 107., For additional disagreement in numbers see Richards, 156.

¹¹⁴ Collier, 153-154. These ground defenses would be prioritized to aircraft factories, aerodromes, and “other specially important or vulnerable targets, mainly at the cost of temporarily depleting the defenses of London and other towns.”

¹¹⁵ Ray, 52.

¹¹⁶ Ray, 52.

¹¹⁷ Bungay, 128.

setting target priority). The invasion plan rested on the *Luftwaffe*'s Eagle Attack to gain air superiority.¹¹⁸ The Germans were supremely confident in their abilities. For example, General Stapf reported to Halder on 11 July that the campaign to destroy the RAF would not last more than two weeks.¹¹⁹ Not only was the *Luftwaffe* feeling time constraints from Hitler but also the British grew stronger in terms of aircraft production every month.¹²⁰ British industrial output in fighter production, for example, outpaced the German by more than double.¹²¹ Despite these constraints, however, the *Luftwaffe* almost succeeded. During the period from 24 August to 6 September, the Germans managed to inflict losses that threatened to bankrupt the British fighter reserve.¹²² Fortunately, for the British, targeting decisions changed and Fighter Command could recuperate.

The other critical vulnerability to the German numerical superiority was targeting changes. The *Luftwaffe* leadership would continually change the target sets during the Battle. These changes were due to shifting focus from the OKW and *Luftwaffe* leadership, poor intelligence, and simple disagreement on how actually to destroy the RAF. German leadership could not decide on the British center of gravity. It was clear that to gain air superiority the *Luftwaffe* had to target the RAF, but did that mean just Fighter Command? The *Luftwaffe* would not only focus on Fighter Command during the campaign, but "ports, merchant shipping, the Royal Navy, the aircraft industry, transport infrastructure and industry."¹²³ The commanders of *Luftflotten 2* and *3*, Kesselring and Sperrle, were not properly brought into initial planning for the campaign.¹²⁴ Kesselring would reflect later in his memoirs on the lack of direction just before the Battle began: "In contrast to our previous campaigns, there was not one conference within the *Luftwaffe* at which details were discussed with group commanders and other services, let alone with the High

¹¹⁸ Bungay, 115.

¹¹⁹ Richards, 155.

¹²⁰ Bungay, 97.

¹²¹ Bungay, 97.

¹²² Richards, 190. 7 September also coincided, however, with a change in targeting. For 7-14 September, the gross loss of Hurricanes and Spitfires again fell below the gross production.

¹²³ Bungay, 125.

¹²⁴ Ray, 44.

Command or Hitler himself.”¹²⁵ The *Luftwaffe* received orders to expand its target sets on 16 July, six days after the British thought that the Battle had begun.¹²⁶ Denis Richards would note that after the opening Eagle Day, the Germans left the radar stations alone and began attacking other targets.¹²⁷

Even after Kesselring took control and focused on Fighter Command targets during the “hardest days,” the targets after 7 September changed to London.¹²⁸ Dowding would later comment, “It brought an intense feeling of relief to me – intense relief. I could hardly believe that the Germans would have made such a mistake.”¹²⁹ The targets ranged from those required for an invasion to those needed for air superiority, and then to those needed for strategic bombing. At least one author has concluded Göring bears a large responsibility for distributed effort by not “limiting the choice” to specific targets “which the fighter force relied.”¹³⁰

Poor intelligence hampered German target identification. At the beginning of the campaign, the *Luftwaffe* Intelligence’s assessment of fighter strength was not too far off but gravely underestimated the value of the radar stations.¹³¹ Major Josef “Beppo” Schmidt, the leader of the Intelligence branch of the *Luftwaffe*’s operations staff, would claim, “The British and French air forces were out of date, that the defenses of the UK were weak and that aircraft production was low.”¹³² He would make other mistakes as well. He omitted mention of the “repair and maintenance organization” that put damaged RAF aircraft back into service rapidly.¹³³ After finally circulating information about radar to the *Luftflotten* on 7 August, he concluded: “that it tied units to their home bases and made assembly at critical points difficult.”¹³⁴

Beppo Schmidt would receive no outside help either. Other intelligence could have provided insights into the valuable role played by the British radar

¹²⁵ Quoted in Ray, 44.

¹²⁶ Ray, 45.

¹²⁷ Richards, 165-166.; Collier, 160.

¹²⁸ Richards, 183.

¹²⁹ Quoted in Wright, 184-185.

¹³⁰ Collier, 191.

¹³¹ Collier, 162.

¹³² Ray, 36.

¹³³ Bungay, 188.

¹³⁴ Bungay, 188.

stations. For example, German signals intercepts linked British radio direction of fighters to “a new radiolocation system.”¹³⁵ This information would come as a shock when reported to General Wolfgang Martini, the chief of the *Luftwaffe*’s signal communications system.¹³⁶ No one shared this information with Schmidt. What is now known as “all-source intelligence fusion” could have revealed the magnitude of the capability this radar chain provided the British. However, this was not possible, as sharp rivalries between Intelligence agencies “brought no sharing of material.”¹³⁷ The German intelligence agencies followed the general German political system set up by Hitler of division of power and competition between subordinates.¹³⁸ Orders would come to attack the radar stations from General Jeschonnek, the *Luftwaffe*’s chief of general staff.¹³⁹ However, the Germans never realized the extent of British reliance on the radar stations, and Schmidt’s intelligence reporting never improved.

Again, the Germans made no consensus on the targets that would destroy the RAF and prepare for the invasion. The *Luftwaffe* was potentially so over-confident that they tried to execute both target sets, air superiority and invasion prep, at the same time. At the start of the Battle the targets included naval and maritime ports and facilities but made no mention of Fighter Command’s defensive plans.¹⁴⁰ The indecision went back even before the fall of France. In November of 1939, Beppo Schmidt noted: “that British policy foresaw a long war in which she hoped to defeat Germany ‘by severing our entire foreign trade, both imports and exports.’”¹⁴¹ The original idea for Great Britain was similar with an attack “through her vulnerable trade routes,” and the report “made clear that the prime German aim was not attacks on airfields, which would divert effort, but ‘the paralysis of British overseas trade’.”¹⁴² Hitler would never commit to the alternate invasion plan. As late as 17 June, the

¹³⁵ Bekker, 145.

¹³⁶ Bekker, 145.

¹³⁷ Ray, 46.

¹³⁸ Ray, 46-47. On air matters, Intelligence was gathered by eight, and radar information by ten different agencies. This most likely resulted in ignorance of the wide use of RDF in British defenses, and the Dowding C2 system in general.

¹³⁹ Bekker, 146.

¹⁴⁰ Ray, 38.

¹⁴¹ Ray, 37-38.

¹⁴² Ray, 37-38.

Navy found that Hitler had not expressed an intention to invade.¹⁴³ Only in early July were invasion-preparation orders issued, but even Hitler's directive on 2 July still stated the invasion as "only a plan."¹⁴⁴ The entire blame for failure cannot fall on German Intelligence. *Luftwaffe* commanders vacillated between the two plans. German Intelligence had minimal time to understand the Dowding C2 system and the proper way to take it down once German leadership decided to defeat Great Britain with an invasion, rather than a siege/blockade. Some blockade/siege-plan targets even held over.

Beppo Schmidt was hardly alone in his failure. There were others in the organization who would assess aspects of the campaign inaccurately or accurately, which influenced *Luftwaffe* decision making. Major Freiherr von Falkenstein of the general staff, speaking for the *Luftwaffe*, grossly overestimated RAF fighter losses.¹⁴⁵ He concluded that diverting to targets other than the RAF would not impede its collapse.¹⁴⁶ German intelligence reporting on aircraft destruction, a measure of effectiveness, was inaccurate.¹⁴⁷ In addition, senior *Luftwaffe* leaders continued to ignore assessments of the effectiveness of British aircraft repair capabilities. *Luftwaffe* leaders would combine this information with reports from the front of weakening British resistance to air attacks.¹⁴⁸ These reports resulted in target sets changing again on 7 September. This time the *Luftwaffe* focus was not on Fighter Command or ports and shipping, but attacks against London.

British COG and Critical Vulnerabilities

The strength of the British defense was Fighter Command and its command and control organization, which included its early warning radar chain. Fighter Command HQ acted as the central processor of information from the radar warning system.¹⁴⁹ It did not make any tactical decisions, which

¹⁴³ Ray, 41.

¹⁴⁴ Ray, 41.

¹⁴⁵ Bekker, 170.

¹⁴⁶ Bekker, 170.

¹⁴⁷ Collier, 198.

¹⁴⁸ Bekker, 171.

¹⁴⁹ Bungay, 62.

resided with the Groups.¹⁵⁰ The Groups would pass orders to the sectors “specifying which units to send up and which raids to intercept,” then the sectors were responsible for completing the intercept between the fighters and the enemy.¹⁵¹ The sectors were also responsible for the return of the fighters.¹⁵² Thus, the first two benefits of the Dowding system are apparent: decentralized command and flexible basing. “That is a point that must not be ignored,” Dowding later commented, “I might have been right, and I might have been wrong in doing that, but I did not want to control completely the tactical work of the Groups. That was mainly because I appreciated that different situations arose in different Groups.”¹⁵³

Second, the organization was simple. Roles within the organization were clear and information extensively shared.¹⁵⁴ Headquarters at Bentley Priory could give out information to both groups and sectors, and sectors themselves could “plug into the local Observer Groups” that were tracking the raids over land.¹⁵⁵ Also, anyone in the system could find information on raids, when those personnel wanted and from anybody else.¹⁵⁶ This did not confuse the sectors because there were assigned roles to what each component could do with the information. The groups and sectors had their responsibilities, and the sectors themselves would each usually control only three squadrons.¹⁵⁷

Third, the “Dowding system was robust.”¹⁵⁸ Communications went through the existing telephone system; a series of stand-by operations rooms constructed at sector stations, and the radar towers themselves were difficult to destroy (already discussed).¹⁵⁹ For example, Biggin Hill experienced damage on 31 August but continued its functions in a nearby village.¹⁶⁰ The emergency equipment could not handle the usual number of aircraft, so two of the three

¹⁵⁰ Bungay, 63., Wright, 177-178.

¹⁵¹ Bungay, 63., Wright, 177-178.

¹⁵² Bungay, 63.

¹⁵³ Quoted in Wright, 146-147.

¹⁵⁴ Bungay, 64.

¹⁵⁵ Bungay, 64.

¹⁵⁶ Bungay, 64-65.

¹⁵⁷ Richards, 178.

¹⁵⁸ Bungay, 65.

¹⁵⁹ Bungay, 65.

¹⁶⁰ Richards, 179-180.

squadrons operated under adjoining sectors.¹⁶¹ The British repair system was also in top form. The RAF established a wide range of capabilities including repair depots, detachments of Royal Engineers, and even Post Office employees to assist in repairing telephone lines.¹⁶²

Fourth, the system was flexible. “Both groups and sectors could take over temporary control of others’ squadrons,” and each group could call support from another group at any time.¹⁶³ Dowding would back up this flexibility with his leadership style. Dowding described support for Park in the following way: “[Park] did not have the aerodromes or the facilities to accommodate all the forces that we might have liked to have available in his Group in the south, and I thought that the right idea was that the Groups on his flanks should back him up. I expected that they would all work closely together in achieving that. Any reference to my Headquarters for decisions about that always meant delay, and since time was so pressing we could not have any delays.”¹⁶⁴ The airfields in the system also would show flexibility. Airfields belonging to other commands filled in during operations as temporary bases, refueling depots, semi-permanent bases for detached squadrons, and tactical and administrative grounds.¹⁶⁵

Fifth, the Fighter Command continuously worked to improve the system. As one author concluded, “The skill of the radar operators was paramount to the system’s effectiveness.”¹⁶⁶ When a bottleneck occurred in the information processing central location at Bentley Priory minimum qualifications rose and replacements added.¹⁶⁷ These actions would result in streamlining efficiency in plots.

¹⁶¹ Richards, 179-180.

¹⁶² Collier, 235.

¹⁶³ Bungay, 65. The Sector stations could handle the added fighter amount. Each one was capable of controlling six squadrons, when only three were actually assigned.

¹⁶⁴ Quoted in Wright, 174.

¹⁶⁵ Bungay, 62. Collier, 173. Bungay describes two such bases such as West Malling or Detling, belonging to Coastal Command. Collier describes the airfields at Croydon and Martlesham as offering, “Quasi-permanent bases for squadrons detached, on tactical or administrative grounds, from the headquarters of the sector. Others, like Hawkinge and West Malling, were more often used as temporary bases or forward landing grounds, although they too might serve as more permanent bases if the need arose.”

¹⁶⁶ Bungay, 66.

¹⁶⁷ Bungay, 66.

Finally, the system allowed Dowding and his group commanders to get maximum use out of their inferior numbers. Without the system, “Fighter Command would have had to keep planes in the air the whole time, flying standing patrols as they had in France.”¹⁶⁸ The British simply did not have the numbers for this option. Standing patrols also wasted resources regarding pilot hours, fuel, and engine hours. According to one author, “on 18 August, one of the busiest days in the whole battle, only 45% of the 866 sorties were flown to counter three major *Luftwaffe* attacks. 56 sorties (6%) were standing patrols to protect shipping (necessitated by the shorter warning times over the channel) and the remaining 49% were flown to intercept a lone reconnaissance aircraft.”¹⁶⁹ All standing patrols would have made these numbers worse.

Detection for the system was also of paramount importance. Depending on the altitude of German fighters, radar station could ‘see’ over the water for approximately a hundred miles.¹⁷⁰ The British built nine CH (Chain Home Radio Direction Finding [RDF]) stations and twenty-two CHL (Chain Home Low looking RDF) stations during the Battle of Britain itself.¹⁷¹ Duplicate transmitters also built redundancy into the system, and “two pools of twelve MB 2 mobile stations were created.”¹⁷² The British even anticipated jamming, with anti-jamming equipment fitted to stations in 1939.¹⁷³

What was one of the British strengths was also one of their weaknesses. The critical vulnerabilities for the whole system were the radar surveillance and sector stations. Vital operations occurred above ground in unarmored buildings. Accurate attack by the Germans on these locations would severely cripple the system and sometimes did. On 18 August, KG 76 made an attack on the sector stations of Kenley and Biggin Hill. They were able to put the operations room at Kenley out of action, but the success was just a fluke.¹⁷⁴ The Germans assumed “that such key installations were lodged in reinforced underground cells. No one dreamed that they were located, virtually

¹⁶⁸ Bungay, 67.

¹⁶⁹ Bungay, 67.

¹⁷⁰ Richards, 202.

¹⁷¹ Bungay, 64.

¹⁷² Bungay, 65.

¹⁷³ Bungay, 65.

¹⁷⁴ Bekker, 165.

unprotected, on the airfields.”¹⁷⁵ Keith Park would later comment that, “Had the enemy continued his heavy attacks against Biggin Hill and the adjacent sectors and knocked out their operations rooms or telephone communications, the fighter defenses of London would have been in a perilous state during the last critical phase when heavy attacks have been directed against the capital.”¹⁷⁶

Lines of Operation / Decisive Points

German Lines of Operation

The centers of gravity discussed above should tie directly into lines of operation derived from the air superiority objective. Germans lines of operation were erratic owing to a continual change in targeting strategy as well as unclear critical factor analysis. Since the Germans did not see the “channel phase” as their opening assault, we begin with the Eagle days. The *Luftwaffe*’s “Eagle Attack” would have to create a decisive victory and gain air superiority as a precondition for an amphibious invasion.¹⁷⁷ As discussed, Fighter Command’s stations and radar locations were only *part* of the extensive target list. No matter what the targets were, the Germans were hoping their Me-110s would draw the British fighter squadrons into combat. The bomber formations would then follow “a well-judged time interval.”¹⁷⁸ By then the Germans hoped the British squadrons would then be low on gas and be forced to land to refuel and re-arm. At this point the British squadrons would be ripe for attack.¹⁷⁹ Such was the German plan. It turned out that Dowding and Park would only let their squadrons intercept when the raids included bombers. This decision would make actual selection of targets that much more important, which proved to be one of the German vulnerabilities.

German targeting changes were complicated by problems in target identification. Only 40% of the raids targeted Sector Station airfields, and the bulk of these did not begin until the end of August.¹⁸⁰ “Eagle Attack” days were

¹⁷⁵ Bekker, 165.

¹⁷⁶ Collier, 216-217.

¹⁷⁷ Bungay, 115.

¹⁷⁸ Bekker, 152.

¹⁷⁹ Bekker, 152.

¹⁸⁰ Bungay, 285.

intense, with five separate raids in the southeast on 15 August, but the British were able to surge to meet the incoming raids and the attacks themselves. The space between the raids provided the British ground crews time to turn the aircraft.¹⁸¹ On 16 August, Göring ordered expanded the target list even more to the British aircraft industry.¹⁸²

For all of their efforts, the Germans were having some success. On the same day, 16 August, the Germans targeted numerous aerodromes including West Malling and Tangmere.¹⁸³ Continual attack on the right airfields would have an effect. Serviceable aerodromes for the British in the most important sectors were ample, but if the *Luftwaffe* were able to keep the attacks up, and “impair the working of more vital sector stations, serious difficulties might arise.”¹⁸⁴

Not until the 19 August conference, however, did *Luftwaffe* leadership finally agree to focus on Fighter Command.¹⁸⁵ The conference took place during a lull in the fighting due to bad English weather. This operational pause allowed the Germans to begin to assess the situation. After that conference, Kesselring would focus on Fighter Command. This period would include the hardest days for the RAF. For example, Kesselring used small groups of dive bombers to attack Fighter Command targets on 28 August and surround them with as many fighters as possible.¹⁸⁶ The Messerschmitt Bf 109s would manage to “catch a lot of the defenders on the climb, and the tally for the day was sixteen British aircraft for only four German.”¹⁸⁷ Stephen Bungay would write, “It was the sort of day the *Luftwaffe* had needed from the first.”¹⁸⁸ He added, however, it was “too late and made no difference,” as British fighter losses during this period did exceed the output from production.¹⁸⁹

British Lines of Operation

¹⁸¹ Richards, 169.

¹⁸² Bungay, 340.

¹⁸³ Collier, 199.

¹⁸⁴ Collier, 199.

¹⁸⁵ Bungay, 285.

¹⁸⁶ Bungay, 342.

¹⁸⁷ Bungay, 342.

¹⁸⁸ Bungay, 342.

¹⁸⁹ Richards, 190.

The British line of effort was simple enough – defend against the incoming raids. RAF leaders, however, would have difficulty on agree on the precise line of operation to accomplish this. These leaders split into two camps. The first believed the *Luftwaffe* would give up if their attacks proved costly, regardless of damage inflicted.¹⁹⁰ The second believed the Germans “would give up if they were convinced that they were not achieving their aim.”¹⁹¹ Both views seem similar, but they would drive differences in how to handle an incoming raid. The first would find it better to meet the raids in mass in order to shoot down fifty of the enemy. The time it took to mass forces, however, would come at the potential cost of allowing raids to inflict massive damage on the ground. The second view placed emphasis on target defense and was, therefore, “to remain in being and offer undiminished and constant opposition, thus denying the *Luftwaffe* air superiority.”¹⁹² This approach translated into meeting raids as quickly as possible, therefore not allowing time to assemble in large formations. The objective of this view would be to minimize both one’s own losses in the air and damage to the defensive ground system.¹⁹³ Keith Park of No. 11 Group would preferred the latter given his proximity to the *Luftwaffe*. Park would comment in the discussion, “Owing to the very short warning received of enemy raids approaching England, or the South of England; it would have been quite impossible to intercept enemy formations with big wings before they bombed their targets such as the aerodromes and aircraft factories. At the very best, big wing formations from No. 11 Group, if we had used them, would have intercepted a few of the German raids after they had unloaded their bombs on vital targets, and were able to take evasive action by diving away in retreat under cover of their own fighter formations or escorts. The German escorting fighters, having the advantage of height and being freed from the need to escort their bombers, would have decimated our fighter squadrons.”¹⁹⁴

Leigh-Mallory’s experience would be different in No. 12 Group. His main base for opinion would come on 15 August. The Operations Room at No. 13

¹⁹⁰ Bungay, 133.

¹⁹¹ Bungay, 134.

¹⁹² Bungay, 134.

¹⁹³ Bungay, 134.

¹⁹⁴ Wright, 173-174.

Group would pick up the German raid from the north almost an hour before they were to cross the coast. With such amounts of time, forming the “big wing” to counter the incoming raid before reaching its targets was possible. *Luftflotte* 5 would suffer significant losses in that raid as a result.¹⁹⁵ However, most of the time the wing formation would encounter massive German raids stripped from most of their escort. The bombers from *Luftflotte* 5 did not have any escorts, owing to range traveled. Dowding ascertained the “destruction or paralysis of Fighter Command was, therefore, an essential prerequisite to the invasion of [the] islands”, and his prime task was to prevent that.¹⁹⁶ The plan chosen then by Park and Dowding was to meet then raids before they reached their targets, at the expense of forming up in a “big wing.” For the British, Keith Park used the “intercept as soon as possible” effort and not wait to form a Leigh-Mallory “big wing” in his lines of operation.

Decisive Points

No one day was the decisive point for the Battle. The RAF won the decisive point of air superiority over the course of the Battle. However, there would be good days for the British and hard days. Victory won by slowly wearing down the *Luftwaffe*.

The British Chiefs of Staff saw the main decisive point for preventing an invasion as continued RAF existence.¹⁹⁷ The *Luftwaffe* would spend 1,887 aircraft, and the RAF 1,547 aircraft, in trying to gain or prevent air superiority respectively.¹⁹⁸ Fighter Command would end up losing 1,023 aircraft and account for all but a handful of the *Luftwaffe* losses, achieving a 1.8:1 kill ratio.¹⁹⁹ Fighter Command’s system flexibility and Park’s line of operation would have a lot to do with this result. Two keys to these results were using his aircraft at the right time and the survivability of his airfields. Dowding would comment on the period of 8 August to 10 September, “13 aerodromes in the Group [11] underwent a total of over forty attacks in three weeks, but Manston

¹⁹⁵ Richards, 167.

¹⁹⁶ Ray, 54.

¹⁹⁷ Ray, 49.

¹⁹⁸ Bungay, 368.

¹⁹⁹ Bungay, 368.

and Lympne were the only two that were unfit for day flying for more than a few hours.”²⁰⁰ German intelligence failures, discussed in detail previously, also played a considerable role. Perhaps Beppo Schmidt’s intelligence was wrong, maybe other agencies did not share the correct info, and perhaps the *Luftwaffe* leadership was not trying to attack Fighter Command airfields solely, but it seemed that “the *Luftwaffe* had attacked quite irrelevant fields.”²⁰¹

Due to a lack of concentrated effort on Fighter Command and its associated critical vulnerabilities from the beginning, the defenses never weakened in their ability to meet raids, while the German fighters were wearing themselves out.²⁰² Admiral Erich Raeder, Chief of the German Navy, would open a 14 September conference with the following statement: “The present air situation does not provide the conditions for carrying out the operation, as the risk is still too great.”²⁰³ Stephen Bungay tabulated daily losses that worked to Fighter Command’s favor (see Table 1.1 below):

Table 1.1: Select Kill Ratios during Battle of Britain

Date	RAF Losses	<i>Luftwaffe</i> Losses	RAF Kill Ratio
11 August	17	20	1.2:1
12 August	20	27	1.4:1
13 August	13	47	3.6:1
15 August	32	75	2.3:1
18 August	34	69	2:1
30 August	23	23	1:1
31 August	37	33	1:1
7 September	23	41	1.8:1
15 September	28	56	2:1
27 September	29	57	2:1

Source: Bungay, Stephen. *The Most Dangerous Enemy: A History of The Battle of Britain*, (London: Aurum Press Ltd, 2000), 371.

The disparity in losses is starker when the human cost factors in due to German crewed bombers. The *Luftwaffe* lost 2,698 airmen, compared to 544 from Fighter Command.²⁰⁴

²⁰⁰ Bungay, 369.

²⁰¹ Bekker, 155.

²⁰² Bungay, 370.

²⁰³ Richards, 188.

²⁰⁴ Bungay, 373.

If there was a decisive day, it was when Hitler removed restrictions and Göring changed the targeting from Fighter Command to London. Göring would call his two *Luftflotten* chiefs to The Hague on 3 September where he would “press the view that current tactical policy should now be abandoned in favor of a large-scale assault on the most important target – the English capital.”²⁰⁵ He, Kesselring, and Sperrle would have to determine if the British fighters had become sufficiently weak that the bombers could attack without undue risk.²⁰⁶ Kesselring wanted to compel Fighter Command to commit its final reserves and move its bases north of London if they destroyed the bases in the south.²⁰⁷

In making this assessment, Kesselring fell victim to faulty intelligence in three ways. First, he believed Fighter Command to be on their last reserves. Second, he would not realize advantage gained by destroying the British radar chain in the southeast with because he did not understand the British reliance on it. Third, he would not know that attacking the fighter bases is what brought the RAF fighter arm to its hardest days. At this point, Göring might have also seen larger opportunities for the *Luftwaffe*. Göring must have forgotten that forcing the RAF north of London would have gone a long way to providing air superiority over southeast England for an invasion. It also seems that both Göring and Hitler believed the bombing of London might lead to British capitulation. The Germans would learn in 1940 what the Allies later learn in 1941-1943: bombing city populations did not cause them to revolt against their leaders and force capitulation.

Arrangement of Operations / Intervening Variables / Assumptions

Park would benefit by arranging operations according to his preferred method, early intercepts with small scrambled groups. Park would always try to limit standing patrols, and preferred scramble operations. Other patrol missions merely diverted resources and exhausted crews.²⁰⁸ This tactic saved pilot time, fuel, and engine hours. Park’s arrangement of operations was consistently in dispute with Leigh-Mallory’s desire for big-wing tactics. Park

²⁰⁵ Bekker, 171-172.

²⁰⁶ Bekker, 171-172.

²⁰⁷ Bekker, 171-172.

²⁰⁸ Bungay, 179.

proved correct on 29 January 1941, when “Leigh-Mallory ran an exercise reproducing the airfield raids Fighter Command experienced in early September. His airfields were bombed while the planes were still on the ground.”²⁰⁹ One of the drawbacks however in this type of operation is that group commanders and controllers would not be able to meet the enemy “with forces large enough to rout him.”²¹⁰

Stephen Bungay takes issue with the intervening variables most commonly identified by researchers in favor of the British. These variables are the German lack of a long-range heavy bomber and a long-range escort fighter.²¹¹ He suggests if the Bf 109 pilots had flown with extra gas, they would have been out of ammunition.²¹² Greater fighter range, however, could have meant more activity from *Luftflotte 5*. Greater fuel allows for longer dogfights instead of feeling pressure to “get off a shot before bingo fuel,” the fuel required to fly home. Bungay similarly dismisses the long-range heavy bomber argument.²¹³ He suggests bombing accuracy was more important and increased payload would not have increased accuracy much. In this point, Bungay’s argument is convincing.

Assumptions

Summarized here are the assumptions held by both sides, discussed in detail above. Dowding and Park made an accurate assumption regarding lines of operation. The line of operation sought a cost-imposition strategy against the *Luftwaffe*, which proved to be accurate.²¹⁴ The accuracy of the assumption, however, must be tied to the German willingness to force the invasion of England without achieving air superiority. An aerial stalemate imposed by the British would do little to stop the invasion once ground forces were on the island. The key German assumption, voiced by General Jodl “that if the British were subjected to air attack and a siege which would reduce their food supply, their will to resist could be broken, and the government would capitulate,”

²⁰⁹ Bungay, 362.

²¹⁰ Collier, 188.

²¹¹ Bungay, 376.

²¹² Bungay, 376.

²¹³ Bungay, 377.

²¹⁴ Bungay, 134.

would prove to be inaccurate.²¹⁵ German assumptions did not receive help from woefully inadequate intelligence before and during the campaign.

Conclusion

The German end state was to coerce Great Britain into terms so that Hitler could focus on his primary objective of Russia. The strategic objective would be to provide the coercion with the threat of invasion and, if that failed, to launch it. The Germans saw attainment of air superiority as the necessary step before launching the invasion. The desired effect of their campaign was to make the invasion credible by gaining air superiority. Hitler hoped this would be enough to force English leaders to negotiate and later he hoped pressure from London's civilian population, as a result of area bombing, could provide the same effect.

The British end state was a victory at all costs. The British strategic objective was to prevent the invasion, which military leaders believed necessitated their operational objective, air superiority. The objectives necessary to prevent the invasion, however, only required denying air superiority to the *Luftwaffe*. The strategic effect British leaders hoped to achieve was to demonstrate to American leaders the nation was capable of resisting the Nazis and encourage American support.

The German center of gravity was their numerical superiority and possession of initiative. Their critical vulnerabilities, however, were time, due to British fighter production, and the interplay between leadership, poor intelligence, and targeting.

The British center of gravity was Fighter Command and its command and control system, the Dowding system. Their critical vulnerabilities also stemmed from the same system. They were the radar and sector control stations in the system.

As for lines of operation, the Germans had numerous ones owing to continual change or expansion of targeting priorities. The British mainly relied on Dowding and Park's vision for an immediate interception, slow attrition, and

²¹⁵ Bungay, 31.

preserving the ground organization over Leigh-Mallory's preference for "big-wing" formations that would risk ground targets.

The German errors during the Battle of Britain were individually small but overwhelming cumulatively. German leaders never decided on how best to defeat the British until the campaign had already begun. The *Luftwaffe* was over-confident in its abilities and tried to execute too many plans. *Luftwaffe* intelligence drew misleading and incorrect conclusions about the importance of the radar chain and had no information about the Dowding system or its command nodes. *Luftwaffe* leaders convinced themselves they were winning the Battle of Britain, based on inadequate intelligence reporting and faulty measures of effectiveness. Indecision at the beginning of the campaign caused many German losses without much return until Kesselring started to focus on Fighter Command. Kesselring's change would not occur until 24 August. Eventually, even he would change again and advocate for attacking London, most likely based on poor intelligence assessments and his desire as an airman to bring the United Kingdom to its knees through air power alone.

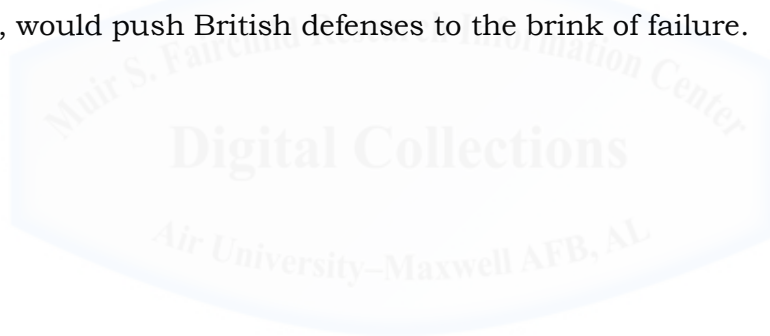
Several factors explain the British, and specifically Keith Park's, success during the Battle of Britain. One of the biggest involved the disagreement in RAF leadership about how to fight the *Luftwaffe* attacks, discussed earlier. Adolf Galland, one of Germany's top aces, ran the German fighter force on the Channel coast later in the war. He did well against heavy odds and gave Leigh-Mallory a "drubbing over the channel dash of the Scharnhorst and Gneisenau in February 1942."²¹⁶ The proximity and base location in the theater favored Park's style of avoiding the time needed to form into a 'big-wing'.

The differences in the British operational approach echo those of the maritime theories outlined in the Introduction. Park's approach appears to more closely follow the ideas of Corbett: preservation of forces and strategic defense with tactical offense. Leigh-Mallory's approach, in contrast appears more Mahanian: large fleets seeking a decisive battle in the air. Fortunately for the British, Park would be the right leader in the right place at the right time. His strategic defensive approach and tactical offensive alert tactics proved to be the more effective operational design. Fighter Command never gained air

²¹⁶ Bungay, 364.

superiority over large areas of southern England until the end of the Battle of Britain, yet were able to deny air superiority to the Germans. In this context, Fighter Command applied Corbett's ideas on challenging command when not able to take control of the domain. The *Luftwaffe* only achieved air parity, which they deemed insufficient to launch the invasion.

After the war, the Russians would ask the Wehrmacht's most senior operational commander, Field Marshall Gerd von Rundstedt, "which battle of the war he regarded as most decisive." They expected him to say 'Stalingrad.' What he said was, 'The Battle of Britain.' After hearing that, "they put away their notebooks and left."²¹⁷ This quote shows the importance that German leadership placed on losing the Battle of Britain, and the immense success won by the RAF during the opening campaigns of Western Front. The next chapter looks at a similar set of circumstances, with the British defending yet another island against German and Italian attacks. The Axis campaign against Malta, however, would push British defenses to the brink of failure.



²¹⁷ Bungay, 386.

Chapter 3

The Siege of Malta

The strategic significance of the island of Malta for both sides cannot be underestimated in the Mediterranean Theater during World War II (WWII). Malta would have strategic significance because of its geographic location. Its position in the central Mediterranean, and in particular astride the sea lines of communication (SLOC) between Italy and North Africa, would have a considerable effect on the Germans in North Africa. German Field Marshal Erwin Rommel, more popularly known as “the Desert Fox,” would succeed or fail due to the continuation of logistical supplies from the European continent. His supply line, however, would pass within the range of British bombers on the island of Malta. Malta and its location were necessary considerations for most of the major belligerents in WWII during their planning for and campaigns in the Mediterranean.

Fighting for or to isolate the island would occur from Italy’s entrance into the war in June 1940 until the Allies invaded the Italian mainland. This chapter will focus on two specific times when the Germans and Italians would make a concerted effort to address or neutralize British forces on the island. These two Axis attempts would occur in the spring of 1941 and the period between late fall 1941 to summer 1942, which included the toughest days for the British and Maltese on the island. As with the preceding chapter, this one uses the operational design framework outlined in Chapter One as the template for campaign analysis. This template includes a quick historical overview of the campaign, the end states of combatants, objectives, effects, centers of gravity and critical vulnerabilities, lines of operation, and decisive points. The chapter concludes with the arrangement of operations, intervening variables, and assumptions.

Historical Overview

German and Italian forces would first visit the island of Malta in the spring of 1941. Their objective was to suppress the Royal Navy (RN) and Royal Air Force (RAF) while the Germans transported Erwin Rommel’s *Afrika Korps* to

Tripoli, and protect his early logistics train.²¹⁸ To execute the operations, the Germans would move *FliegerKorps X* from Norway to Sicily in December of 1940. It included some 230 aircraft total, including 160 dive-bombers. Their assigned mission was to attack the British Mediterranean Fleet, specifically its carriers, and to neutralize Malta.²¹⁹

By 1941, the British had begun their preparations to defend the island. Recognizing early Italy would be entering the war on the German side, the British political and military leadership decided to build on their strategic location. Air Vice Marshall Arthur Longmore, Air Officer Commander of the RAF in the Middle East (including Malta), ordered the construction or improvement of four airfields: Hal Far near the south coast, Ta'Qali inland near Mdina, Luqa behind Valletta (the capital), and Kalafrana, a flying boat base on the south-east coast.²²⁰ Throughout history, various empires had fought for control of Malta, and as such, its main harbor in Valletta benefitted from medieval fortifications and defensive works.²²¹ Longmore would also rectify “barely adequate” communications survivability by burying cables underground to protect them from bombing.²²² By the time of the first German raids in January 1941, the RAF had 40 Hawker Hurricanes, Vickers Wellington bombers, and reconnaissance aircraft stationed on Malta. Early investments in air defenses would help keep Malta operational during the war.²²³ Over the next couple of months, until May 1941, the Germans and Italians would raid the island to support Rommel. Despite the raids, the British were able to maintain control of the air with steady infusions of replacement Hurricane fighters launched from aircraft carriers in the western Mediterranean sailing from Gibraltar.²²⁴

²¹⁸. Bekker, Cajus. *The Luftwaffe War Diaries*, (New York: Doubleday & Company, Inc., 1968), 235.

²¹⁹. Elliot, Peter. *The Cross and the Ensign: A Naval History of Malta 1798-1979*, (Annapolis: Naval Institute Press, 1980), 100.

²²⁰. Elliot, 98.

²²¹. Elliot, 98.

²²². Ehlers, Robert S. *The Mediterranean Air War*, (Lawrence: University Press of Kansas, 2015), 103.

²²³. Ehlers, 38.

²²⁴. Ehlers, 75.

In May 1941, however, *FliegerKorps X* would withdraw from Sicily and move in preparation for Hitler's Greece campaign and attack on Crete. Italian forces were primarily responsible for neutralizing Malta and attacking convoys.²²⁵ The German losses during the Crete campaign would provide a reprieve for Malta as they had psychological effect on Hitler later.²²⁶ During this reprieve, the British on Malta would change commanders, from Longmore to Air Vice Marshal Hugh Lloyd. Also, the British would continue offensive convoy attack operations that put pressure on the Axis supply lines flowing into North Africa.

On 29 October 1941, Hitler would give orders to transfer units from the Russian front back to Italy to deal with the problem of Malta. During November 1941, Generalfeldmarschall Albert Kesselring and the headquarters of *Luftflotte 2* moved to Rome.²²⁷ Kesselring would bring with him 325 aircraft, 229 of which were serviceable.²²⁸ By the third week of December, intent on the build-up of forces to crush the Maltese threat, the German and Italian air forces in Sicily numbered approximately 250 long-range bombers and reconnaissance aircraft, and almost 200 fighters. To counter this menace, Lloyd would only have 60 serviceable bombers and 70 serviceable fighters – of which none were front-line Supermarine Spitfires.²²⁹ The massed German aircraft succeeded in bringing Malta's defenses to the brink of collapse. The Luftwaffe's second assault on Malta began in December 1941 and would reach its height in April 1942.²³⁰ During this time, the British would merely try to survive the German and Italian aerial onslaught. At the end of April 1942, the RAF on Malta had lost its capability to attack Axis convoys. Kesselring and Admiral Erich Raeder, German Chief of Staff of the Navy, would press for an invasion of Malta, code-named Operation Hercules, to deal with the Maltese threat once and for all. Disagreements between Hitler and Rommel on one hand over prioritization of

²²⁵. Richards, Denis. *Royal Air Force 1939-1945: Vol 1. The Fight At Odds*, (London: Her Majesty's Stationary Office, 1953), 307.

²²⁶. Richards, Denis and Saunders, Hilary ST. G. *Royal Air Force 1939-1945: Vol. 2 The Fight Avails*, (London: Her Majesty's Stationary Office, 1954), 181.

²²⁷. Richards and Saunders, 181.

²²⁸. Bekker, 236.

²²⁹. Richards and Saunders, 182.

²³⁰. Bekker, 235.

resources for other theaters, and Kesselring and Raeder on the other who saw Malta as the operational priority, would delay the invasion.

By June 1942, the Americans would help ferry aircraft to the island to help in its defense, and larger Royal Navy submarines would play pivotal roles in carrying supplies to the island.²³¹ In addition, the British would mount daring relief convoys in June 1942, Operations Vigorous and Harpoon, as well as a convoy in August, Operation Pedestal, that would keep the island from starvation and total collapse.²³² Over the summer of 1942, Hitler would order the withdrawal of Luftwaffe aircraft from the attack on Malta and shift them to Russia and North Africa. Italian aircraft would continue the aerial siege. By this point, however, the infusion of more-capable Spitfire aircraft and a minimum amount of convoys, the situation looked brighter for the RAF and the island from its lowest point in April 1942. The aerial siege of Malta would end by November 1942, due to setbacks for Rommel in North Africa and a lack of Italian capability to subdue the island.

End State / Objectives / Effects

Elimination of the RAF and Royal Navy (RN) threat from Malta continued to be the German and Italian end state during the two distinct periods of German emphasis, occurring in the spring of 1941 and the spring of 1942. The island of Malta not only protected the British shipping route from Gibraltar to Egypt, but it also obliged the Italians to take a risky route to supply North Africa, and opened Axis convoys to attack.²³³ The Axis powers would at least have to suppress Malta to ensure the success of its Africa campaign headed by Rommel.²³⁴ Suppression would give Rommel a secure supply line as a prerequisite to his expansion into Egypt and the capture of the Suez Canal. When not suppressed, during the summer and fall of 1941, the Axis position in North Africa would become so vulnerable that Hitler would reposition Luftwaffe

²³¹. Elliot, 102.

²³². O'Hara, Vincent P. *Struggle for The Middle Sea*, (Annapolis: Naval Institute Press, 2009), 186.

Shores, Christopher, Brian Cull, and Nicola Malizia. *Malta: The Spitfire Year 1942*, (London: Grub Street, 1991), 515-516.

²³³. Bekker, 235.

²³⁴. Bekker, 236.

forces in Sicily “at the expense of his forces in Russia, for the express purpose of neutralizing Malta.”²³⁵

It would be the British political leadership, namely Churchill and his advisors, to recognize the importance of Malta to their goal of defeating Rommel in North Africa, maintaining access to supplies in the Middle East, and eventually capturing Sicily. Churchill’s directive on 14 April ordered the Royal Navy’s Mediterranean Fleet “to stop all seaborne traffic between Italy and North Africa.”²³⁶ Malta would be an essential enabling base of operations. Churchill described Malta as the critical link between Egypt and Gibraltar, and he was willing to defend it “with the full strength of the Empire.”²³⁷ Air Marshal Arthur Tedder, who would take over the RAF Middle East in 1941, emphasized Malta’s position as in range of ports in Sicily and Libya and the SLOCs connecting them. Tedder would go on to state “No investment of fighter aircraft would earn a richer dividend than one used to ensure the safety of our only base in the central Mediterranean for carrying out reconnaissance, interrupting the enemy’s supplies to Africa, and refueling reinforcement aircraft en route to Egypt.”²³⁸ For the British, Malta “represented an unsinkable aircraft carrier.”²³⁹ The British end state would be the survival of Malta as a base for offensive operations.

The German objectives would end up supporting their end state, but only when given sufficient priority. Kesselring and Raeder both pushed for the invasion of Malta, Operation Hercules. For the suppression mission in the spring of 1941, *FliegerKorps X* was to attack the Mediterranean Fleet and neutralize Malta. It was successful in doing so, thereby enabling Rommel’s initial gains in North Africa.²⁴⁰ After a hiatus in the summer and fall of 1941, *Luftflotte 2* arrived after convoy supply problems resurfaced. The second suppression mission, carried out during the spring of 1942, was to subdue the island by destroying the garrison’s convoy attack capability and breaking

²³⁵. Richards and Saunders, 169.

²³⁶. Ehlers, 90.

²³⁷. Elliot, 101.

²³⁸. Ehlers, 97.

²³⁹. Bekker, 235.

²⁴⁰. Elliot, 100.

Maltese will with an aerial blockade, thereby starving the population and garrison of supplies of food and ammunition to keep the “fortress in being.”²⁴¹

To accomplish the second suppression mission operationally, Kesselring would order five separate tasks. The first was the destruction of all British aircraft in the air or on the ground. Aerial photography would show the concentration of fighters around Ta Kali, whose neutralization was the first step in achieving air superiority.²⁴² Second, Kesselring ordered the destruction of the island’s radar system and anti-aircraft defenses, perhaps as a lesson learned from the Battle of Britain. Third, he tasked forces to enforce a blockade against all attempts to resupply the island. Fourth was conducting heavy attacks on warships and harbor installations. Fifth and last, the Germans sought to mine the approaches to all harbors, particularly the Grand Harbor, with magnetic mines.²⁴³ Kesselring and Raeder both recognized that these tasks might not be enough and German interests demanded an occupation of Malta, not just its bombardment from the air.²⁴⁴ Original plans for Operation Hercules called for an Italian amphibious invasion and German airborne assault immediately after major raids had ended from *Luftflotte 2*. Kesselring would still be able to cover the assault before returning with his forces to Russia.²⁴⁵ Neither Kesselring nor Raeder was able to convince Hitler to approve the invasion plan.

The British strategic objective was to “close the ring” around the Axis powers, specifically Italy. The British sought to conquer North Africa first, reopen the Mediterranean, and attack Italy to knock it out of the war. Whitehall saw these steps, after successfully defending the home island, as the preliminaries to strengthen their position and weaken the Axis powers as they

²⁴¹. Elliot, 113. The fortress in being concept draws from Corbett’s ‘fleet in being’ idea. As long as British forces occupied Malta, they posed a threat to Axis operations in the Central Mediterranean. Even without any active convoy attacks on Axis supply lines, the Germans and Italians would have to expend military resources to protect lines of communication. The question for the Axis leadership was where to gain economy of force. What was “cheaper,” forces to suppress, or the forces needed to invade and occupy?

²⁴². Bekker, 237.

²⁴³. Shores, 23., Richard and Saunders, 182.

²⁴⁴. Richards and Saunders, 191.

²⁴⁵. Ehlers, 196.

waited for the United States to enter the war.²⁴⁶ Operationally the British saw these steps as depending on not only Malta's survival but the island as a key to Axis convoy attack and as a staging base. To maintain Malta's position, the British attempted to supply the island with four convoys a month.²⁴⁷ Successful resupply with convoys would prove harder than expected, the most noteworthy of which were Operations Vigorous, Harpoon, and Pedestal.²⁴⁸

Centers of Gravity / Critical Vulnerabilities

The German center of gravity during both periods would be Hitler's decision-making, specifically the prioritization of other theaters for resources driving Hitler to decide against the need for Operation Hercules. The Germans and Italians were in a position to conduct an invasion just after *Luftflotte 2's* action in April 1942, and the Italians, combined with the German airborne capability, possessed sufficient forces to conduct a forcible entry onto the island. The two critical vulnerabilities in Hitler's decision-making process, however, were his profound and entirely unwarranted distrust of Italian military capability, and his prioritization of other fronts in the war. Both of these vulnerabilities would keep Hitler from launching Operation Hercules and finally ending the threat Malta posed. At a meeting at the end of April 1942, Admiral Raeder would press hard for an invasion, and even Mussolini himself declared he would not advance another step into Africa until Malta had fallen. Rommel offered to lead the attack himself, but Hitler thought it best to leave the invasion to the Italians.²⁴⁹ After Hitler's declaration, Mussolini would state he needed three more months of preparation to conduct the invasion.²⁵⁰

After the meeting, Hitler described how he saw an invasion of Malta playing out. Ever confident in his own military genius, he stated to Kesselring,

²⁴⁶. Ehlers, 5, 12.

²⁴⁷. Elliot, 115.

²⁴⁸. Shores, 317-360, 448-510. He goes into detail on the conduct of Operations Vigorous and Harpoon, the dual axes convoy supply attempt in June 1942. Vigorous would be launched from Alexandria, Egypt, and Harpoon launched from Gibraltar. The other significant supply runs to the island would be the Spitfire additions from aircraft carriers, including the HMS Eagle and USS Wasp, in the months of March, April, and May.

²⁴⁹. Elliot, 102., Bekker, 239.

²⁵⁰. Bekker, 239.

“I guarantee what will happen. The Gibraltar Squadron will leave port at once, and the British fleet will come steaming from Alexandria. Then you will see what the Italians will do. At the first radio reports, they will go running back into their Sicilian harbors – warships, transports, and all. And you and your paratroops will be left sitting on the island alone.”²⁵¹ Rommel would end the discussion by promising he could reach the Nile Delta in a single thrust after the swift conquest of Tobruk.²⁵² Therefore, the Italians remained in charge of an invasion delayed in preparations for three months after the Luftwaffe had brought Malta to the brink of collapse. These events also acted in concert with Hitler’s focus on other fronts. Hitler would designate the Russian, Western, and North African fronts as having priority for German forces.²⁵³ The Luftwaffe moved back to Russia after successfully suppressing Malta, and *Luftflotte 2* redistributed among other theaters. The new summer offensive in Russia demanded more aircraft, which at the same time left the Allies with the opportunity to bring large shipments of Spitfires to the island.²⁵⁴

The British center of gravity was capable RAF and RN forces located on Malta. The two critical vulnerabilities for these forces were the island’s defenses and vital convoy resupply. The British would use a combination of fighter and defense alerts to counter incoming raids, moving of bombers from the island to preserve them when Axis bombing was particularly intense, and salvaging or replace anti-aircraft weapons.²⁵⁵ They also became adept at airfield repair, and would eventually receive significantly improved air defense capabilities when Spitfires arrived to replace less capable Gladiator biplanes and Hurricane fighters. Attrition of British forces due to German attacks would take their toll, however, and resupply of the island would be a determining factor for the British to sustain their defense. Nevertheless, the Germans were able to inflict significant losses, but flights of fighters flown in during the months of April and May, as well as harrowing resupply trips by RN submarines and fast ships such as the HMS *Welshman*, would keep the island barely functioning until supplies

²⁵¹. Bekker, 244.

²⁵². Bekker, 253.

²⁵³. Elliot, 102.

²⁵⁴. Bekker, 242-243.

²⁵⁵. Bekker, 242.

from the larger convoys such as Operation Pedestal could arrive.²⁵⁶ With the German decision to redistribute Kesselring's forces elsewhere, and the arrival of Spitfires and the HMS Welshman, the siege of Malta passed through its most critical phase for the British.²⁵⁷

Lines of Effort / Decisive Points

German/Italian Lines of Effort

The two chosen lines of effort for the Axis forces were air superiority to enact an aerial blockade of RN resupply, and continual bombardment of British military forces on Malta. These lines of effort were to suppress British forces pressuring Axis SLOCs and to enable an amphibious invasion if necessary. The suppression of Malta in early 1941 would enable Rommel to transfer to North Africa, and for his supply line to be established. *FliegerKorps X* drew this duty and enabled the opening of the North African operations. Only when aircraft left to assist in Operation Barbarossa, the invasion of Russia that summer, and *FliegerKorps X* moved to Greece to help in the Crete campaign, did the suppression of Malta ease and allow the British to interdict Rommel's supply line significantly.

In December of 1941, the Germans would return to Italy. *FliegerKorps II* would follow Kesselring's headquarters (*Luftflotte 2*) and take up station in Sicily to help counter British supply line attacks. This move gave the Luftwaffe three major formations in the Mediterranean: *FliegerKorps II* in Sicily, *FliegerKorps X* in Greece and Crete, and *Fliegerfuhrer Afrika*.²⁵⁸ Kesselring would also change Luftwaffe tactics in his prosecution of the attack. Apart from the identified anti-aircraft batteries and a few special targets, the Germans abandoned tactics of dispersed bombing. German dive-bombers would now mass and act as a united force against three targets: the British fighters on the ground; the bomber and torpedo plane bases of Luca, Hal Far, and Kalafrana; and, the docks and harbor installations of Valletta naval base.²⁵⁹

²⁵⁶. Richards and Saunders, 197.

²⁵⁷. Richards and Saunders, 197.

²⁵⁸. Richards and Saunders, 182

²⁵⁹. Bekker, 237.

With increased assets, Kesselring would also step up the number of German attacks. In the last week of December, over two hundred sorties struck the island, as opposed to the previous average of 60-70 per week. In the opening days of January 1942, the number of sorties would jump to 500.²⁶⁰ British Hurricane fighter pilots did their best to break up formations and keep the damage manageable, but the Germans responded by strike more violently.²⁶¹ The German onslaught reached its height between 24 March and 12 April, when they flew 2,000 sorties against Malta.²⁶² The daily peak during this period saw 300 sorties on 7 April and 20 April.²⁶³ The first target was the fighter base at Ta Kali.²⁶⁴ After its sufficient destruction by mid-March, the Germans expanded their attack to the other bases, and by the end of the month, the Luftwaffe was bombing Valletta's harbor and docks.²⁶⁵ In the month of April, the Germans and Italians would fly 4,900 sorties against Malta and drop 6,728 tons of bombs. In the words of one author, "The Valletta sirens sounded on average every 2.5 hours."²⁶⁶

The Germans would watch for British reinforcements and attack them as quickly as possible. Using radar on Sicily and the Italian radio monitoring service, the Germans gained knowledge of aircraft flying in from carriers launched out of Gibraltar.²⁶⁷ During one such mission, the Germans and Italians monitored 47 Spitfire deliveries from the USS Wasp and HMS Eagle. Twenty minutes after landing, German bombs rained down on Hal Far and Ta Kali airfields reducing the number of serviceable aircraft from 47 to 17.²⁶⁸

The Axis blockade of Malta was also in full effect. Individual British fast ships and large submarines were able to bring supplies to the island, but large convoys faced formidable German and Italian attacks. The example of Operation Vigorous, launching from Alexandria, Egypt, illustrates the challenges convoys faced. Italian Admiral Angelo Iachino skillfully used the

²⁶⁰. Richards and Saunders, 182.

²⁶¹. Richards and Saunders, 182.

²⁶². Ehlers, 194.

²⁶³. Richards and Saunders, 192.

²⁶⁴. Bekker, 238.

²⁶⁵. Ehlers, 184., Bekker, 233, 238.

²⁶⁶. Richards and Saunders, 194.

²⁶⁷. Bekker, 239.

²⁶⁸. Richards and Saunders, 194., Elliot, 124., Ehlers, 185., Bekker, 239.

threat of his battleships to create conditions that allowed repeated Axis air and light surface force attack of the convoy.²⁶⁹ Faced with such attacks, the ships in the Operation Vigorous convoy turned around after sizeable losses. It would be one of the Italian Fleet's major victories.

The end of April was the low point in terms of morale for the British and local population on Malta. One author characterizes the reasons morale ebbed in the following way: "Malta's airfields had been reduced to deserts, the quays and dockyards to wreckage and the warships themselves had been driven out."²⁷⁰ The British and Maltese on the island anticipated an invasion and "occupation of the island."²⁷¹

The Axis powers had already conducted significant planning for Operation Hercules, down to the level of individual units and their specific tasks. The invasion plans included a German paratrooper division, two Italian airborne divisions, two corps of Italian infantry, six independent Italian battalions, and two tank battalions.²⁷² The landing operation would take place in two phases: "first, the paratroopers who had captured Crete would land in the south of Malta away from Grand Harbor, and they would spread out and capture the three airfields, to allow gliders full of troops to land. Then a strong Italian force would make a landing in Marsaxlokk Bay, using 52-ton tanks captured from the Russians on the eastern front."²⁷³ In April 1942, *Luftflotte 2* had 467 operational aircraft to cover the assault; however, they would soon leave for Russia.²⁷⁴ After they had left, opportunity began quickly to fade. In May, 700 tons of bombs fell on the island, "just a tenth of the April total."²⁷⁵ When some returned at the end of 1942, "swarms of Spitfires were waiting for them."²⁷⁶

British Lines of Effort

²⁶⁹. O'Hara, 174.

²⁷⁰. Bekker, 239.

²⁷¹. Bekker, 239.

²⁷². Ehlers, 197.

²⁷³. Elliot, 118.

²⁷⁴. Ehlers, 196.

²⁷⁵. O'Hara, 171.

²⁷⁶. Elliot, 130.

The British did not sit idly by while the Axis pummeled the island and prepared for its invasion. Early in the war, the British would recognize Malta as the hinge of their offensive and defensive actions in the central Mediterranean. The island sat astride SLOCs to Libya and offered a location for land-based airpower in the Mediterranean, seen as necessary for sustained ship attacks. The British Chiefs of Staff would agree on 9 October 1940 to bring the Hurricane and Martin Maryland flights up to squadron strength (12 aircraft) and then later up to 16 aircraft.²⁷⁷ The commitment of forces to Malta suggests its importance in British strategic calculations, especially given the remaining threat of German invasion of the British Isles.²⁷⁸

The first Luftwaffe air campaign against Malta, however, would shock the British commanders despite their prior experience with German attacks during the Battle of Britain. In March 1941, *FliegerKorps X* would wreak such havoc that Air Vice Marshal Longmore, the Air Officer Commanding (AOC) at the start of the war, would redeploy his Short Sunderland flying boats and Wellington bombers to Egypt to prevent their destruction.²⁷⁹ Despite Luftwaffe raids, the British would maintain control of the air with a steady infusion of Hurricanes, keeping operational fighters above 40, and successful use of centrally controlled anti-aircraft guns.²⁸⁰ The carrier HMS Ark Royal would end up ferrying 327 fighters to Malta until it sunk by torpedoes from a German U-boat in November 1941.²⁸¹

The shock of German air attacks passed as suddenly as they arrived. In May 1941, *FliegerKorps X* would leave for Greece. Luftwaffe attacks rapidly declined and the responsibility for neutralizing Malta passed to the Italians.²⁸² The absence of the Luftwaffe would give the island its first reprieve. Air Vice

²⁷⁷. Ehlers, 38.

²⁷⁸. Ehlers, 38.

²⁷⁹. Richards, 306; Ehlers, 68.

²⁸⁰.; Ehlers, 75. Bekker describes the British employment of anti-aircraft guns on Malta in the following way: "The British guns were centrally controlled. As hundreds of them went off at once, the maneuverable little Ju87s just had time to alter height and direction before, 50 seconds later, multitudinous explosion puffs appeared exactly along their previous course. As the bombers went down, salvos would go off at 9,000, 6,000, and 4,500 feet, and finally all the light flak on land and on the ships in harbor would join." Bekker, 234

²⁸¹. Elliot, 106.

²⁸². Ehlers, 75, 125.

Marshall Hugh Lloyd arrived in Malta in May 1941 to take over command from Longmore. Lloyd arrived to find remarkable progress already made in aircraft ground protection, but he would continually make improvements and extend the airfields.²⁸³ The Air Ministry Works Directorate built new airfields, taxi tracks, dispersal locations, radar stations, and operations rooms.²⁸⁴ In addition, “the taxing strips and dispersal points were gradually linked together, until a fighter could move on the ground from one field to another, to find the most serviceable runway.”²⁸⁵ The net effect of these infrastructure improvements increased the effectiveness of scrambling and defending fighters. Also during this time, the RAF and the Royal Navy would escort two convoys from the West, thereby restocking the island with “food, bombs, ammunition, aviation fuel, and many other vital commodities.”²⁸⁶ This restock of supplies would prove to be important because Luftwaffe forces would return at the end of the year.

As the Luftwaffe attacks ramped up in January 1942, the British would again fight to maintain air control. The RAF would use alert and scramble tactics to counter the incoming raids.²⁸⁷ In February, 235 alert launches scrambled against 222 Axis attacks on Malta.²⁸⁸ The raids would reach the point, however, where intercepting the German mass was challenging. Despite the best British efforts, German bombers were getting to their targets. On 22 February, the attacks would again reach the point where the RAF withdrew their Bristol Blenheim bombers to Egypt.²⁸⁹ German raids would also attack British convoys headed for Malta. By the end of February, the British would miss their four-merchant ship per month target, and the ships that did manage to get through could only arrive under the safety of night.²⁹⁰ Attrition would slowly wear down RAF fighter numbers as well as the supplies that had arrived. The RAF pilots did their utmost to break up German formations, but most attacks would arrive before interception.

²⁸³. Elliot, 130.

²⁸⁴. Richards and Saunders, 181.

²⁸⁵. Elliot, 130.

²⁸⁶. Richards and Saunders, 181.

²⁸⁷. Shores, 30-31.

²⁸⁸. Shores, 99.

²⁸⁹. Richards and Saunders, 182.

²⁹⁰. Elliot, 115.

In the face of deteriorating conditions, the British gave priority attention to the better dispersal of aircraft and an intensive program of building blast and splinter proof pens for them. Soldiers, sailors, and Maltese civilians would create 84 large pens for Wellington bombers and more than 200 small versions for fighters, fuel trucks, control vans, and even steamrollers.²⁹¹ Lloyd would comment later, "Everyone made pens. Officers, clerks, photographers, storemen, wireless operators, aircrew, in fact, anyone with a few hours to spare[.] My HQ, for example, provided a daily working party of 53 officers and men for 3 ½ months."²⁹² The Army would also assist the ground crew in the clearance of shrapnel, rubble, and unexploded bombs after raids, and "above all, the filling in of bomb craters." Continuous rapid airfield repair would be necessary to stay in action.²⁹³

As a result of the destruction caused by German raids, British personnel and the Maltese population moved underground. Pilot accommodations had to be within easy walking distance of the airfields. "Officers and men slept in shelters, in caverns and dugouts, in underground cabins, and disused tunnels."²⁹⁴ Damage to the naval base would also continue, and by March, only the underground workshops were in full operation.²⁹⁵ The attacks during the months of February, March, and April would take their toll on the island. Throughout the German onslaught, however, "Moral never faltered, and the pilots and anti-aircraft gunners remained ardent."²⁹⁶

Air Marshal Tedder, the commander of the RAF Middle East, would visit Malta on 12-13 April. There Lloyd would brief him that "the German's 160 fighters and 250 bombers on Sicily were destroying his fighter force faster than he could restore it."²⁹⁷ Lloyd's plan was to shelter his remaining fighters and use them sparingly until receiving reinforcements, and then aim to regain air superiority and recall the Wellingtons and Blenheims from Egypt.²⁹⁸ Tedder would be particularly concerned about the severe damage to Malta, and

²⁹¹. Shores, 65.

²⁹². Shores, 66.

²⁹³. Ehlers, 185., Richards and Saunders, 183.

²⁹⁴. Richards and Saunders, 203.

²⁹⁵. Elliot, 122.

²⁹⁶. Richards and Saunders, 183.

²⁹⁷. Ehlers, 188.

²⁹⁸. Ehlers, 188.

redouble efforts to bring in fighters, specifically more advanced Spitfires, as well as supply convoys.²⁹⁹

At the end of April, the Germans would make their decision to redeploy *Luftflotte 2* to other theaters, but the situation on Malta would remain tenuous. Most of the April reinforcement of 47 Spitfires would meet their tragic fate previously described. Nevertheless, May would bring a change of fortunes for the British. On 9 May, 64 Spitfires took off from the carriers USS *Wasp* and HMS *Eagle* and 61 would reach the island. This time, Lloyd was determined not to repeat the loss of 20 April and had the aircraft pushed back into shelters already stocked with fuel, ammunition, and equipment. As a result, they refueled and resupplied for combat in minutes.³⁰⁰ By the time the Germans did attack, half of the new Spitfires were in the air to greet them.³⁰¹ Then on 10 May, HMS *Welshman* arrived with much-needed supplies.³⁰² After resupply in early May, the Germans and Italians would lose “more bombers than during the whole five weeks of the main offensive with its 11,500 sorties.”³⁰³ The British would later view 10 May as the turning point in the siege.³⁰⁴

Malta would continue to face starvation in May, June, and July. With a sizeable force of Spitfires firmly established, however, it was possible for the British to risk another large resupply convoy.³⁰⁵ The most massive convoys attempted in June would be Operation Vigorous from Alexandria, Egypt (an Italian naval victory already discussed) and Operation Harpoon, launched at the same time, from Gibraltar. The Harpoon convoy sustained devastating damage as well, but it would arrive on 15 June.³⁰⁶ More Spitfires would arrive between 14-19 June and 20-22 July and HMS *Welshman* would complete another supply run on 16 July.³⁰⁷ On 20 July, British submarines would return to the island.³⁰⁸

²⁹⁹. Ehlers, 195.

³⁰⁰. Bekker, 242., Richards and Saunders, 196-197.

³⁰¹. Ehlers, 195., Bekker, 242.

³⁰². Richards and Saunders, 197., Elliot, 130.

³⁰³. Bekker, 242.

³⁰⁴. Bekker, 242.

³⁰⁵. Richards and Saunders, 203.

³⁰⁶. O'Hara, 182., Elliot, 132.

³⁰⁷. O'Hara, 183.

³⁰⁸. O'Hara, 183.

Air Vice Marshal Keith Park, who played a major role in the Battle of Britain discussed in Chapter Two, would arrive to take over command from Lloyd in early July 1942. He would continually improve the supply and defense of the Maltese and change interception tactics for the Spitfires. Park issued instructions to his fighter squadrons to meet German raids north of the island. To this point sufficient numbers of fighters were not available. His intent was to meet the bombers well out to sea before they could reach their targets.³⁰⁹ Park's plan required reliable radar warning and alert pilots. In addition, he stipulated that, "take-offs must be much quicker than in the past, control must be accurate and clear, and squadrons must obey orders immediately."³¹⁰

During the second half of 1942, the British situation in Malta would continually improve. In August, the British would launch Operation Pedestal. It would be similar to Operation Harpoon but on a larger scale. The operation would take losses, with HMS Eagle sunk and additional cruiser and destroyer losses, but the supply ships in the convoy made it through to Malta.³¹¹ The four-merchant-vessel Operation Stone Age convoy would arrive unscathed on 20 Nov 1942 and effectively end the siege of Malta.³¹²

Decisive Points

The decisive point during the entire two-year battle for Malta came at the end of April 1942. It was at this stage that the island was at its most vulnerable and ripe for invasion.

German and Italian suppression succeeded twice. In the spring of 1941, the Germans were able to move Rommel's forces to North Africa and reinforce the Italian convoy system. The reassignment of German air forces to Russia, Greece, and Crete, however, relieved pressure on Malta. The British were able to reconstitute their forces on Malta and resume attacks on Italian convoys. When the Luftwaffe did return, after the Russian winter subdued Barbarossa operations, they again successfully suppressed Malta. Robert Ehlers would correctly identify, however, why suppressing Malta was insufficient: "each time

³⁰⁹. Shores, 431.

³¹⁰. Shores, 431.

³¹¹. O'Hara, 186., Shores, 515-516.

³¹². Ehlers, 272.

the Luftwaffe ended a major series of attacks, Malta rebounded immediately as Hurricanes and later Spitfires flew in from aircraft carriers, reconnaissance and strike aircraft returned, and naval flotillas once again used it as a base for raiding.”³¹³

Suppression of British defenses was necessary for Axis forces to proceed with an invasion of Malta; the ultimate Axis solution required for the problems caused by the island forces. As early as March 1941, Admiral Raeder would urge Hitler to take the island with an airborne assault before too heavily defended.³¹⁴ Raeder would caution, “In British hands this base represents a strong threat to our troop transports to Africa and later for the supply transports...In the opinion of the Air Force, it appears possible to capture Malta by airborne troops; the Navy is in favor of this as soon as possible.”³¹⁵ Hitler instead asked for more studies posed by the difficult terrain on Malta and instead chose to focus invasion efforts in other Mediterranean locations such as Crete. Indecision and inaction on invasion, when the British were at their weakest defensively, was the first missed opportunity for the Germans. The next would be at the end of April 1942, another period where the Luftwaffe successfully suppressed British defenses.

British problems stemmed from technological disadvantages and logistics scarcity. One of the problems was the inferiority of Hurricane fighters to their German counterparts, the Messerschmitt Me-109.³¹⁶ When Air Marshal Tedder visited the island in mid-April, he found the number of serviceable fighters reduced to six, and there would be times when the defense of the island relied on the anti-aircraft guns alone.³¹⁷ The guns operated on a daily ration of fifteen rounds. Dennis Richards and Hilary Saunders would write about airfield conditions at the time: “By then the airfields were a wilderness of craters, the docks and neighboring Senglea a shambles.”³¹⁸ Of 61 merchant vessels that would try to reach Malta in 1942, nineteen were lost, and ten turned back,

³¹³. Ehlers, 68.

³¹⁴. Ehlers, 38.

³¹⁵. Ehlers, 38.

³¹⁶. Elliot, 100.

³¹⁷. Richards and Saunders, 193.

³¹⁸. Richards and Saunders, 193.

resulting in a 48% reduction in the flow of supplies.³¹⁹ This number does not reveal, however, that most convoys would only start getting through starting in June, and none would reach Malta in March and April.

Even with the arrival of Spitfires and meager supplies getting through, German victory in Malta was still possible. As one historian has concluded, continued violent air assault, followed by an invasion “would very likely have overcome the tired and emaciated defenders.”³²⁰ Despite Kesselring and Raeder’s arguments, however, Hitler would remain skeptical of invading the island. His reservations largely stemmed from heavy German air and airborne losses taking another Mediterranean island in 1941: Crete. In consequence, Hitler wanted Italian forces to assume responsibility for invading and securing Malta.³²¹ Italian commanders said they needed time to prepare to take the island. Seeing an opportunity, Rommel sealed the fate of Operation Hercules by stating he would be able to reach the Nile Delta in one strong push. After this decisive blow to the British in North Africa, the Axis powers could then free up their forces in the Mediterranean to deal with Malta.³²² By the end of April 1942, Hitler’s preoccupation with other theaters, and in particular a new summer offensive in Russia and Rommel’s quest for the Nile, would divert aircraft, resources, and most importantly, time from Operation Hercules.³²³ A lack of sufficient numbers of aircraft to cover active theaters plagued Hitler from 1942 onward. Put another way, Hitler would overextend his resources and begin new campaigns without finishing the previous ones. When the Luftwaffe units started to leave at the end of April, air superiority would turn in favor of the British.

Intervening Variables / Assumptions

Several intervening variables affected the siege of Malta. The first was intelligence. Both sides would rely heavily on radar and radio information to conduct attacks or defend against them. For both the Germans and the

³¹⁹. Ehlers, 182.

³²⁰. Ehlers, 195.

³²¹. Bekker, 243., Ehlers, 93., Shores, 229.

³²². Elliot, 118., Ehlers, 61.

³²³. O’Hara, 171., Richards and Saunders, 196.

British, this included intelligence on when and where convoys would be sailing: South from Italy for the Germans, or East and West from Gibraltar and Alexandria, respectively, for the British. The Italians would set up a radio signals service capable of interception as well near Rome in 1936. At the start of the war, the service would expand vastly and equip more powerfully. This expansion would see the birth of the *Centro Radiointercettazione Regia Aeronautica* (CRIRA).³²⁴ CRIRA had primary radio interception units deployed on Pantelleria, Trapani (Sicily), and by mid-1941 Palermo (Sicily).³²⁵ The unit at Palermo was capable of listening to HF radio emissions from Malta, including the signals and messages emanating from Malta's aircraft.³²⁶ The British had a manned tactical intelligence unit named the "Y service." Its purpose was "to intercept, analyze, and interpret coded traffic."³²⁷ The British would use radar combined with this service to help alert for incoming raids. As for the convoy attack assigned to the island, the British enjoyed the unique advantages conveyed by the "Special Liaison Unit, responsible for receiving, distributing, and ensuring secrecy of 'Ultra' signals."³²⁸

The second variable would be the British ability to survive the raids. In addition to the measures the British used described previously, the British would conduct early and continuous work on repairing the airfields. Airfield construction between 1937 and 1939 would result in the completion of four operational airfields. Engineers would start building strong shelters beginning in June 1940, and despite a shortage of motorized transport, fifteen rollers would be available for runway repair, extension, and building additional taxiways.³²⁹ Ehlers describes why these improvements were important for the British forces on Malta: "A growing network of taxiways combined with this repair force allowed aircraft to move quickly from temporarily unserviceable airfields to operational ones. Even during the worst raids, RAF aircraft kept flying."³³⁰ The British adopted several ingenious survival techniques for their

³²⁴. Shores, 23.

³²⁵. Shores, 23.

³²⁶. Shores, 23.

³²⁷. Shores, 24.

³²⁸. Shores, 24.

³²⁹. Ehlers, 125.

³³⁰. Ehlers, 125.

forces as well. During raids, for example, British submarines would submerge and wait out the raids on the harbor floor to avoid damage.³³¹ Finally, the British ability to overmatch the Germans in fighter technology, through the arrival of numbers of Spitfires, went a long way to defending the island and retaining air superiority.³³²

The final intervening variable, explicitly adding to the German decision *not* to proceed with the invasion, was the fallout from previous operations, and more specifically, Operation Mercury. The Germans suffered heavy losses during the invasion of Crete. Even though the Germans would rebuild *FliegerKorps XI*, “Hitler was so shaken by the losses on Crete that he never again authorized a major airborne operation.”³³³ The influence of the experience of Crete on Germany’s supreme leader, combined with the resource requirements for other theaters and a growing distrust of Italian capability, would doom the proposed invasion operation in Hitler’s mind.

German assumptions for the suppression of the island were enough to protect their supply lines. In addition, senior German leaders also assumed that bombardment and blockade would put the island out of action. Their assumption would shatter, however, when they realized that only an invasion would permanently eliminate the threat. The realization, however, came far too late.

For their part, the British had a number of their assumptions challenged. They learned that the Royal Navy alone could not dominate the Mediterranean. Admiral Andrew Cunningham would learn from the disaster in Crete that German land-based airpower could have a crippling effect on British seapower.³³⁴ Experience fighting the Germans in Greece and Crete taught Air Marshal Tedder that, “air superiority was the prerequisite for all successful combined-arms operations.”³³⁵ Air Vice Marshal Longmore, emphasized airpower’s ability to “interdict and in some cases stop air, sea, and ground movement, or to extract a huge price.”³³⁶

³³¹. Elliot, 118.

³³². Elliot, 124.

³³³. Ehlers, 185.

³³⁴. Ehlers, 129.

³³⁵. Ehlers, 85.

³³⁶. Ehlers, 93.

Conclusion

The German end state for Malta was eliminating the island as a threat to their supply lines. To accomplish this end state, the Germans would have two options: continuously suppress Malta's forces, or suppress and then invade. The effect the Germans desired was safety for their supply lines across the central Mediterranean in support of Rommel's operations in North Africa. The Germans would be successful twice in suppressing Malta, in the spring of 1941 and the spring of 1942. Each time they took pressure off Malta, however, the British would reconstitute and continue convoy attacks.

The British end state was to maintain Malta's offensive convoy attack capability by defending it with as much strength as they could afford. Their objectives would be to shuttle in reinforcements as needed and supply the island with four convoys a month. In the spring of 1942, they would fall short of this mark, which threatened the survival of battered forces on island. The British desired effects were continuous strain on Rommel's supply lines into North Africa, maintenance of the link between Gibraltar and the Suez Canal, and preservation of Malta as potential staging base for an invasion of Sicily and Italy to knock the latter out of the war.

The German center of gravity was their superior forces in quality and quantity over the British garrison on Malta. Their critical vulnerability, however, was Hitler not recognizing the need for invasion as the appropriate economy of force option to free Luftwaffe forces for other theaters. The lack of a decision on invading would allow the island's defenders to rebound after each series of German attacks.

The British center of gravity was offensive and defensive capability of the island, both regarding naval and air forces projecting power from it as a home base. The critical vulnerabilities for the British, however, would be the resupply of stores and aircraft to the island. The island was not self-sustaining and relied on outside supply to maintain operations.

For lines of operation, the Germans would directly attack the British critical vulnerabilities. The Germans would devastate the island in 1942, by first taking out the fighters used for air defense and then later destroying the

harbor where submarines and surface ships would reconstitute to conduct Italian convoy attacks. The British could only indirectly affect the decision making of Hitler. Causing massive casualties in Crete would have a bearing, and continual pressure on Rommel from the Eighth Army in Africa would play a part. The only direct action the British could take, however, was to defend and supply Malta until the situation in the war changed. The British would get lucky when Hitler decided other fronts deserved higher priority. Each time the operations suppressed Malta, the Germans would move and use Luftwaffe assets in other locations. Their assumption on airpower's capability *permanently* to subdue the island was flawed. Although suppression was possible, a permanent solution to the problem of Malta was an invasion. The Germans had two opportunities to neutralize permanently Malta but did not capitalize on either.

The decision to not invade and eliminate Malta as a threat would be costly to the Germans. Malta would add to their losses in the Mediterranean theater, which would account for 40-50% of Axis losses for the entire war.³³⁷ Even with heavy casualties, the Germans would be in a position to invade at the end of April. However, the defense of Malta would show the Germans how costly suppression operations were over longer periods. Their decision balanced on how much force is required to do one of two options: one, suppress Malta during the duration of the war; or, two, the power needed for an invasion and follow-on occupation. Based on the costly suppression operations and the need for them to "keep Malta down" while Rommel was in North Africa and potentially the Middle East, it would have been less costly overall to proceed with the invasion.

One final lesson, on the British side, relates to prior preparation. Air Vice Marshall Lloyd would later write, "Had we taken serious notice of our supply situation in 1941 and we had taken a strong line and brought the Maltese fully into our confidence, we should not have been reduced to our very parlous state in the spring of 1942."³³⁸ Senior British leaders would do a superb job in recognition of Malta's strategic importance, but would fail to

³³⁷. Ehlers, 403.

³³⁸. Richards and Saunders, 208.

prioritize the resupply of Malta in the reprieve between spring 1941 and spring 1942.

Again, there are similarities, differences, and lessons when comparing the two Axis Malta campaigns to maritime theories outlined in the Introduction. The forces concentrated on Malta could not seek decisive battle along the lines of Mahan. Massing to confront the Luftwaffe would have only risked destruction of the RAF on Malta that much sooner. These were the same British aircraft necessary to gain some protection for convoys steaming for the island. Loss of minimal air parity would significantly reduce the chances for survival of Malta as an operational Allied location. This situation did in fact occur at the end of April 1942. British forces on island reached a point where they could no longer significantly disrupt any Axis operations, either supply convoys into Africa or any kind of potential invasion.

The Siege of Malta highlights a concept from Corbett's maritime theory, the "the fleet in being." As long as Malta existed as an operational basing location for the British, it would factor into German planning calculations in the Mediterranean and North Africa. Corbett wrote that as long as the "fleet in being" existed and showed some active behavior, an enemy must expend forces to protect against it. As long as the Axis forces allowed Maltese bases to survive, they required a plan for SLOC protection through the central Mediterranean. This state existed so long as the Middle East Command could show Malta still posed a threat. Middle East Command launched successful attacks from Malta thereby keeping the threat posed by Malta active in German calculations. Middle East Command also supplied Malta at great loss because of the costs imposed by its existence. In the final analysis, the Axis leadership failed to seal their victory by invasion after winning air superiority in April 1942. The next chapter turns to a case study in which the British were on the operational offensive to recapture islands seized from them four decades after the Siege of Malta ended.

Chapter 4

The Falklands War

The Falklands War lasted a short 74 days and receives passing attention in United States field grade professional military education.³³⁹ This lack of attention seems odd given the apparent similarities between its events and the situation confronting the United States in a potential showdown with the Chinese in the Western Pacific. The Falklands War included a Western military power intending to project its forces across a large distance, in an air and maritime dominated environment, to dislodge occupying forces of a regional power with numerical superiority. The fighting between the British and the Argentinians was compact in time but provides a wealth of lessons for a potential future crisis involving similar conditions.

This chapter, as with others, will use the operational design framework as the means to analyze the Falklands War. It begins with a historical overview of the campaign, which offers a prelude to conflict, and a chronological summary of events. This chapter then discusses the end states for both sides, the strategic and operational objectives driven by those desired end states, and the intended effects. It then identifies the Centers of Gravity (COGs) for both the British task force and the Argentine military, and assesses their critical vulnerabilities. A description of the lines of effort for both sides follows and culminates in four decisive points for a British victory. Intervening variables and starting assumptions will then clarify the campaign results, and, finally, the chapter's conclusion will recap the salient points and identify their relationship to the two maritime theories surveyed in the Introduction.

Historical Overview

The historical foundations for the animosity over the Falklands stem from a territorial dispute between the Spanish and British empires starting in the mid-17th century. The Falkland Islands themselves lay approximately 400

³³⁹ For instance, the field grade professional military education course, Air Command and Staff College, does not cover the war.

nautical miles (nm) east of the Argentinian coast. During the 17th century, mainland Argentina was under Spanish rule. The Falkland Islands themselves were uninhabited at that time and were first “discovered” by British sailors making the southern maritime voyage around South America. Eventually, both the British and Spanish monarchs would claim sovereignty to the islands but two developments set the stage for future conflict: treaty-based sovereignty ceded the islands legally to the Spanish, but the British took *de facto* possession by occupying the island with settlers. The modern-day conflict would pit an Argentine military junta desiring sovereignty back over the islands against an island population wishing to remain under British rule and calling on the British government to honor its commitments to protect them.³⁴⁰

The political crisis that began in 1975 stemmed from continual encroachment by the Argentinians on British possessions in the South Atlantic. Such encroachment was enticed by failing negotiations to give the Argentinian government complete sovereignty over the islands and an Argentine perception of lack of significant British interest in them. Examples of escalating tension included, but were not limited to, British diplomats in Buenos Aires receiving warning of British encroachment on Argentinian territorial waters that the Argentine junta would claim extended within 200nm of the Argentine coast and continental shelf, which in the Argentine military junta’s view included the waters surrounding the Falkland Islands.³⁴¹ The British government’s lack of commitment to the area seemed apparent to the Argentinians through such acts as removing HMS Endurance (an ice patrol vessel) back to the British Isles for retirement, leaving no permanent Royal Navy (RN) surface ship presence in the area.³⁴²

Eventually, the Argentinian military-run government would become bolder in employing clandestine actions to create footholds on desired South Atlantic islands, including the Falkland Islands, the South Georgia Islands, and

³⁴⁰ Hastings, Max, and Simon Jenkins. *The Battle for the Falklands*, (New York: W.W. Norton & Company, 1983), 35-40. The civilians on the islands received British military protection by order of parliament.

³⁴¹ Lord Franks. *Falkland Islands Review: Report of a Committee of Privy Counsellors*, (London: Her Majesty’s Stationery Office, 1983), 11-12. These territorial waters claims started in 1975, seven years before physical hostilities.

³⁴² Hastings, 42.

the South Sandwich Islands. The Argentinians would use commercial interests to establish a presence on the islands, for example scrap metal salvaging businesses, and then use military resources to supply and protect their citizens. In this way, the Argentinian junta clandestinely contested control through its military presence in the area.³⁴³

Lack of progress in sovereignty negotiations with the British Foreign Service continually frustrated the leaders of Argentina's military junta. The junta leaders soon concocted plans to use military force to establish sovereignty over the Falkland Islands. On 30 March 1982, the Argentinian Navy would sail from the South American mainland under a cover story of resupply and citizen protection on other island chains, but with the real purpose of transporting the Amphibious Commandos Group of the Argentine Marine Corps to invade the Falklands.³⁴⁴ The following table outlines the salient events that transpired over the 74 days of the war:

Table 4.1: Falklands War Significant Events

2 April	Argentine invasion of the Falkland Islands. The Argentinians attacked with marine commandos, having air and sea superiority because of the distance away of the British Fleet. ³⁴⁵
5 April	The British carrier group called back from training exercise sails south from Portsmouth.
7 April	South Atlantic Theater of Operations established – 200nm radius circle around the Falkland Islands (<i>Islas Malvinas</i> in Spanish), South Georgia Islands (Georgias), and South Sandwich Islands (Sandwich del Sur).
9 April	The British 3 Commando Brigade sails south aboard the SS Canberra on order from Whitehall while negotiations continue with the Argentinian junta. ³⁴⁶
12 April	British declared maritime exclusion zone comes into effect – same circle plus extension to the west up to 200nm from Argentinian

³⁴³ Hastings, 55. Constantine Davidoff, Argentinian scrap-metal merchant, applies to clear an abandoned whaling station in South Georgia. In *The Battle for the Falklands*, Max Hastings makes the assumption “that at this stage Anaya’s [Argentine Chief of Naval Operations] navy decided to use Davidoff’s incursion to mount a similar exercise to that of 1976 on Southern Thule [military resupply/protection]. It would register Argentina’s claim as obliquely as possible in order to confuse and ultimately minimize British responses.” Another toehold would thus be secured on a British possession, and the British government would find it the harder to complain later concerning the Falkland Islands.

³⁴⁴ Falkland Islands Review, 64.

³⁴⁵ Hastings, 73.

³⁴⁶ Hastings, 341.

	mainland coast. British nuclear submarine HMS Spartan arrives off Falkland coast to enforce exclusion zone.
15 April	British Task Force reaches Ascension Island for staging.
18 April	Admiral Sir John Forster "Sandy" Woodward sails south with his battlegroup to confront the Argentine Navy. Argentinian carrier returns to mainland port with maintenance problems.
25 April	The British recapture South Georgia with minimal Argentine resistance.
30 April	Total exclusion zone comes into force, same dimensions as 12 April.
1 May	Failed negotiations, first day of hostilities, initial Special Air Service (SAS) and Special Boat Service (SBS) landings on the Falklands. Attacks on Port Stanley and Goose Green airfields (both on East Falkland Island).
2 May	Argentine cruiser ARA General Belgrano sunk by RN submarine HMS Conqueror.
7 May	Total Exclusion Zone extended to 12nm from Argentine mainland.
8 May	British War Cabinet dispatches Royal Marine landing force south from Ascension Island.
21 May	British landing on San Carlos begins. Landing is unopposed for two hours. HMS Ardent sunk. British forces have now established a firm bridgehead on the Falkland Islands. Royal Marine Commandos and the Parachute Regiment soldiers are now ashore in substantial numbers. A secure landing base consolidated.
24 May	HMS Antelope sunk.
25 May	HMS Coventry and Atlantic Conveyor sunk.
28 May	British forces recapture the towns of Darwin and Goose Green.
8 June	Second British landing disaster at Fitzroy – HMS Galahad and Tristram landing craft sunk. ³⁴⁷
11 June	Battle for Port Stanley begins.
14 June	Argentine surrender at Port Stanley (main stronghold and Falkland Islands biggest town).

Source: *The Falklands War: the Official History*, (London: Latin American Newsletters Ltd., 1983), 15-21, 25-27, 42, 51, 54, 55.

Lord Franks. *Falkland Islands Review: Report of a Committee of Privy Counsellors*, (London: Her Majesty's Stationery Office, 1983), 64, 70-71.

Hastings, Max, and Simon Jenkins. *The Battle for the Falklands*, (New York: W.W. Norton & Company, 1983), 72-73, 114, 120, 123, 341-343.

The Falklands Campaign: The Lessons, Ministry of Defense (London: Her Majesty's Stationery Office, December 1982), 5.

The British would recapture Port Stanley, the main town on the Falkland Islands, and thereby accept Argentinian surrender. The end of the occupation occurred at substantial cost in both Argentine and British lives. The British

³⁴⁷ Hastings, 343.

South Atlantic Task Force, Task Force 317.0 (the carrier battle group) and Task Force 317.8 (the amphibious task group), lost the following: six ships and had ten more severely damaged; nine Harrier aircraft due to enemy action and accidents, while flying over 1,650 sorties; and 17 helicopters due to enemy fire and seven more as “other losses.”³⁴⁸ The Argentine Navy would lose the submarine ARA Santa Fe and the cruiser ARA General Belgrano, while the Argentine Air Force (AAF) would lose 109 aircraft (British claims), 20 in air-to-air combat and the rest to air-to-ground, surface-to-air, or sabotage action.³⁴⁹ After this brief overview of the Falklands War, this chapter now turns an examination of the campaign from the perspective of operational design.

End States / Objectives / Effects

The Argentine end state was a negotiated settlement and desired recognition of Argentine junta sovereignty over the Falkland Islands and South Georgia Islands through the minimum use of violence.³⁵⁰ At first, the leaders of the Argentine junta would not sanction overt invasion. On the island of South Georgia, Argentine “presence” started as a business venture and expanded with Argentine military re-supplying the island. This investment would serve as the blueprint and catalyst to increased provocative behavior in the region by the Argentinians as they tried to expand control over the area to improve their position at the negotiating table with the British Foreign Office. An assessment by the British “Latin America Current Intelligence Group,” circulated on 31 March 1982, assessed that the “presence” of Argentine military and economic interests were not in particular contrived by the junta. Rather, the junta members exploited the events to “speed up negotiations on the transfer of sovereignty.”³⁵¹ Both Dr. Costa Mendes, chief of Argentine Foreign Ministry, and Admiral Jorge Anaya, head of the Argentinian Navy, thought a *fait accompli*

³⁴⁸ *The Falklands Campaign: The Lessons*, Ministry of Defense (London: Her Majesty's Stationery Office, December 1982), 45-46. Hastings, 316-317.

³⁴⁹ Copley, Gregory R., et al. *Lessons of the South Atlantic War: Proceedings of the Conference on the Anglo-Argentine War of 1982*. (Washington D.C.: Defense & Foreign Affairs Ltd., 1982), 71.,

The Falklands Campaign: The Lessons, 45-46., Hastings, 316.

³⁵⁰ Falkland Islands Review, 74.

³⁵¹ Falkland Islands Review, 66.

was the best approach.³⁵² Anaya believed world opinion would not react negatively to force used in for “anti-colonialism,” and Dr. Mendes did not believe a British military response likely.³⁵³ The leaders of the military junta would devise a quick invasion plan of the Falklands spearheaded by the Argentinian Navy and Marine commandos.

The Argentine strategic objective was to seize the island quickly with commandos. Their rationale was twofold: minimize British response through negotiations; and, present the British with the problem of “tyranny of distance” should they choose to retake them. Neither side in the conflict expected the other to put up much of a fight. Robert Jervis explains the misperception the Argentine junta fell into, cognitive consistency. Jervis explains cognitive consistency as a “strong tendency for people to see what they expect to see and assimilate incoming information to pre-existing images.”³⁵⁴ The Argentine junta believed that democracies wished to avoid casualties and would not forcefully react if the Argentinian Marines could quickly take possession. The junta also believed the international community would support an action based on anti-colonial claims.³⁵⁵ The junta’s plan included putting a few hundred Marines ashore, intermixed with civilian settlers, to complicate any British response.³⁵⁶

The Argentine junta was not the only one to misperceive international politics. The British Joint Intelligence Committee (JIC) demonstrated cognitive dissonance when it assessed the armed forces commanders in Argentina were opposed to the direct invasion, and instead suggested they preferred a continued “pin-prick” strategy.³⁵⁷ Jervis describes cognitive dissonance as a situation where people will actively dismiss or avoid situations and information that contradict tough decisions already made.³⁵⁸ This dissonance also existed in the British Foreign Office. Members of both groups, the JIC and Foreign

³⁵² A *fait accompli* as it refers to military action here means a quick action or seizure that is completed before those affected hear about it, leaving them with no option but to accept.

³⁵³ Hastings, 31, 48-49.

³⁵⁴ Jervis, Robert. *Perception and Misperception in International Politics*. (Princeton: Princeton University Press, 1976), 117.

³⁵⁵ Copley, 11.

³⁵⁶ Hastings, 32.

³⁵⁷ Falkland Islands Review, 12.

³⁵⁸ Jervis, 382.

Office, believed in the effectiveness continued negotiation over the Falkland Islands in the face of contrary evidence from Argentina.

The British recognized the logistics problem incurred by dispatching the South Atlantic Task Force. These problems were compounded by the following factors: a full complement of warships equipped with air-defense systems; Sea Harriers and their support vessels; tankers, supply ships, and hospital ships; an amphibious assault group; and the urgent requisitioning of civilian ships taken up from trade, or STUFT.³⁵⁹ Although indications of Argentine military threat increased, the British government was unwilling to establish enough forces to deter an invasion.³⁶⁰ To the Argentinians, a *fait accompli* seemed possible.

The Argentine operational objective was a marine Commando occupation and a joint Argentine Air Force (AAF) and Argentine Navy defense against British intervention. The AAF and Navy aircraft would be responsible for attacking any British task force sent to intervene, with added capability from the Exocet missile, a standoff anti-ship missile capable of air or surface launch.³⁶¹ Either one of the British aircraft carriers would receive the highest priority in the AAF's target list.³⁶² The Argentine Navy would be responsible for the surface action, and engage the RN with both the cruiser ARA General Belgrano and destroyers armed with Exocet missiles.

The desired Argentine effects were a strengthened domestic position for the Argentine military junta by seizing and "reclaiming" lost territory as well as control of the south sea link between the Atlantic and Pacific Oceans. At the beginning of the 1980s, Argentina's economic troubles were draining confidence in the military-run government. Many in Argentine government saw repossession of the Malvinas, as they termed the Falkland Islands, as an important agenda item, but the junta leaders also saw it as an opportunity to boost popular support for their regime.³⁶³ It also fit with an expansion policy. Members of the Argentine government had a longer-term goal of eventually

³⁵⁹ Hastings, 77.

³⁶⁰ Falkland Islands Review, 78.

³⁶¹ Lt. Gen. (ret.) Xavier Isaac (former Commander, Argentine Air Force), in discussion with the author, 8 April 2016.

³⁶² General Isaac, 6 April.

³⁶³ Falkland Islands Review, 74.

controlling the Falkland Islands, the Northwest Antarctic Peninsula, and access routes between the continents.³⁶⁴

The British end state was to regain physical possession and sovereignty over the Falkland, South Georgia, and South Sandwich Islands. Prime Minister Margaret Thatcher's stated the British objective on 3 April 1982: "To see the islands returned to British administration."³⁶⁵ She would believe throughout the conflict that only a military task force, rather than diplomacy, would achieve the removal of the invaders and restoration of British control.³⁶⁶

The British strategic military objective was to eject the Argentine ground forces from both sets of islands. The British Service Chiefs, concerned over the danger of attrition through weather and enemy action, ruled against a sustained blockade of the islands.³⁶⁷ The Chief of the Defense Staff would issue a directive to the Royal Navy Fleet commander to prepare a plan for landing forces on the Falkland Islands and recovering possession.³⁶⁸

The British operational military objectives to recover possession of the islands were to create and enforce an air and maritime exclusion zone, gain as much air and sea superiority as possible, use the acquired air and sea superiority to protect an amphibious landing, and defeat the Argentine forces after landing. The Royal Navy would dispatch over 100 ships and 25,000 men and women over an 8,000 nm trip, under the codename Operation Corporate. This operation would establish and enforce a total exclusion zone around the islands, thereby attempting to gain air and sea superiority. The British South Atlantic Task Force would then recapture the South Georgia Islands and the Falkland Islands through an amphibious landing of over 5,000 Royal Marines, in Operation Sutton, to reclaim the Islands.³⁶⁹

The desired British effects were to enforce the credibility of British sovereignty claims and for the British government to fulfill its obligation to the British citizen islanders to liberate them. The Foreign and Commonwealth

³⁶⁴ Copley, 12, 17.

³⁶⁵ Hastings, 80.

³⁶⁶ Hastings, 337.

³⁶⁷ Hastings, 125.

³⁶⁸ Copley, 116.

³⁶⁹ *The Falklands War: the Official History*, (London: Latin American Newsletters Ltd., 1983), 40-41. Falkland Islands Review, 13.

Office (FCO) would present the Minister of State, Mr. Nicolas Ridley, three options in the lead up to conflict: break off negotiations and be prepared to defend the islands; give up the islands and offer to resettle the islanders themselves; or continue negotiations in good faith with Argentina looking for a solution.³⁷⁰ Complicating the decision for the FCO, the British government was still feeling haunted by the specter of its last major attempt to protect sovereign territory by major military almost three decades prior over the Suez Canal.³⁷¹ Mr. Ridley's decision, once the Argentine invasion took place, was evident in his telegram to the British Ambassador in Washington D.C.: "In the final analysis we cannot acquiesce in this infringement of British sovereignty and are bound to take action to restore the status quo."³⁷² Some in British Parliament would doubt the efficacy of sending "1,000 men to their deaths simply to enable 1,800 British citizens (and half citizens) to keep the government of their choice."³⁷³ In the end, however, a majority in Parliament felt British credibility and national pride demanded action.

Centers of Gravity and Critical Vulnerabilities

The Center of Gravity for the Argentinian military was the Argentine Air Force and Navy's advantage in numbers supported by their proximity to their home mainland. On paper, numbers favored Argentinian forces: 139 Argentine fixed-wing aircraft to 30 British, one Argentine aircraft carrier to two British, one cruiser to none, eight destroyers to seven British, three frigates to five, three submarines to four, and 11,000 Argentine troops to 8,000 British troops.³⁷⁴ By the end of the campaign, the British would actually bring six submarines, including two that were nuclear-powered and remained submerged for prolonged periods, to the campaign. Few military observers could guess at the impact submarines would have on the conflict. According to external observers prior to the conflict, Argentina possessed "some of the most efficient Armed Forces in South America," and the British would have to overcome

³⁷⁰ Falkland Islands Review, 20.

³⁷¹ Hastings, 82.

³⁷² Falkland Islands Review, 57.

³⁷³ Hastings, 338.

³⁷⁴ Copley, 108. Falkland Islands Review, 32.

unpredictable weather, limited airfield facilities, lack of diversion airports, and a primarily naval response dealing with a surface passage time of 20 days for ships.³⁷⁵

There were three critical vulnerabilities to the advantages of the Argentinians in their Center of Gravity: strategic intelligence; minimal air refueling capabilities; and a failure of joint Air Force / Navy cooperation. First, a lack of reliable and consistent strategic intelligence would hamper Argentine efforts to find the South Atlantic Task Force to apply Argentine advantage in aircraft numbers. The AAF would receive some satellite data from unidentified “external sources” that would indicate size and strength of the South Atlantic Task Force, but they possessed limited information on its day-to-day location.³⁷⁶ After-action reports would identify Argentine laments over no Soviet or Cuban intelligence support to their fielded forces. The AAF relied on tactical reconnaissance to fill in this critical information gap to find the British aircraft carriers in late May, but by then such information would be too late to make the best of Argentina’s proximate advantage.³⁷⁷ The AAF did employ a Westinghouse TPS-43 Ground Radar, but there were still gaps in its range and coverage, which limited its ability to serve effectively as a combat information center.³⁷⁸ The lack of strategic/airborne intelligence and early warning would ultimately limit the AAF capabilities to mass at the right place and time.³⁷⁹

The second critical Argentine military vulnerability was a minimal air refueling capability. The deficit of this capability rendered some of Argentina’s numerical advantage moot. As a result, the AAF was unable to conduct massed operations against the South Atlantic Task Force and overwhelm its defenses. Having only two tankers, the AAF could only launch a limited number of strike aircraft for each mission.³⁸⁰ Argentine sources claim that only 81 of 225 combat aircraft could range the islands, thereby negating any consistent Argentine air superiority over the Falklands, much less a massed carrier strike

³⁷⁵ Falkland Islands Review, 32.

³⁷⁶ Gen Isaac, 8 Apr.

³⁷⁷ Copley, 72. Gen Isaac, 6 Apr.

³⁷⁸ Copley, 68.

³⁷⁹ Hastings, 160-163. Copley, 155.

³⁸⁰ Copley, 69.

or anti-amphibious landing mission.³⁸¹ All of the strike missions flown received planning to the last detail because of fuel and distance, and the Argentine A-4 Skyhawk fighters conducted most of the missions as the Mirages lacked air-refueling capability.³⁸² Compounding the mass problem was an AAF pilot aversion to dogfights with the Harriers because the latter were recently equipped with AIM-9L air-to-air missiles, which allowed for high-aspect engagements.³⁸³ The Argentine pilots would have neither the fuel nor the armament to fight through British defenses for long. British Intelligence suggested the AAF would launch four waves of six aircraft each day to attack the fleet, and the South Atlantic Task Force used twenty Harriers in combat air patrols, as well as picket ships to identify incoming aircraft, to defend the main fleet against this threat.³⁸⁴

The third critical Argentine military vulnerability was the lack of meaningful joint coordination between air and naval forces in the fight for air and sea superiority around the disputed islands. Argentina possessed a navy with substantial air, surface, and underwater capabilities, including six ships fitted with the Exocet sea-skimming antiship missiles.³⁸⁵ Inter-service rivalry and early naval losses, however, would effectively eliminate the Argentine Navy from the fighting and any hope of joint operations with the Air Force.³⁸⁶ At the outset of hostilities, the Argentine Navy would mount its Mirage Super Étendard airstrikes without coordination with the AAF, and the Navy would fail to provide the radar direction the Air Force pilots expected.³⁸⁷ The Argentine aircraft carrier, the ARA Veinticinco de Mayo, would return to port with mechanical problems on 18 April, and the Argentine Navy's failure to win the sub-surface

³⁸¹ Hastings, 219. Copley, 68.

³⁸² Gen Isaac, 4 Apr.

³⁸³ Gen Isaac, 6 Apr. A high aspect engagement occurs when two aircraft approach each other from head on. The British Harriers enjoyed an advantage being equipped with AIM-9L air-to-air missiles. These missiles allowed British pilots the ability to shoot first in these head-on engagements. The armament on the Argentine aircraft, in contrast, required their pilots to maneuver behind the British Harriers before they could employ weapons.

³⁸⁴ Hastings, 131-132., Copley, 45.

³⁸⁵ Hastings, 62, 115.

³⁸⁶ Hastings, 323.

³⁸⁷ Hastings, 219, 323.

fight placed their surface ships at a significant disadvantage.³⁸⁸ A British submarine would sink the ARA General Belgrano while staying totally undetected, and would seriously concern the Navy's leadership to the point the Argentine Navy effectively took no further part in the campaign.³⁸⁹

The Center of Gravity for the British military was its fielded forces, or the South Atlantic Task Force itself, sent to recover the islands. The task force consisted of two main parts: the aircraft carrier group sent to gain and maintain air and sea superiority; and, the amphibious landing party intending to eject forcibly the Argentine occupiers. The two aircraft carriers, HMS Hermes and Invincible, would provide critical capabilities: first, the Harriers required to conduct airfield attacks and air defense of the surface ships and landing party, and second, the helicopters needed for anti-submarine protection.³⁹⁰ After the war, the British military leadership would recognize the importance aircraft carrier played in power projection. In consequence, they ordered two carriers to be continually available on short notice, with a third in refit or reserve.³⁹¹ The carriers would provide the floating airfields required for the key enabling missions previously discussed.

The four critical vulnerabilities stemming from this Center of Gravity were: the Task Force's two aircraft carriers and their Harriers to the air superiority fight; a potential failure of political commitment to the expedition; the vulnerability of the amphibious landing force; and, the vulnerable civilian fleet logistics train. The British aircraft carriers not only provided critical capabilities for the Task Force but also a potentially decisive target for the Argentinian military. Tactical airpower in support of air superiority missions was not available from land-based aircraft and only supplied by the carriers; even then, the British Task Force would only sail with 20 Harriers.³⁹² A combination of a surface ship picket line and air-to-air intercept from the Harriers, as previously mentioned, would supply the cover for the amphibious

³⁸⁸ *The Falklands Campaign: The Lessons*, 22-23.

³⁸⁹ *The Falklands Campaign: The Lessons*, 17., Copley, 43., Hastings, 32., Gen Isaac, 8 Apr.

³⁹⁰ *The Falklands Campaign: The Lessons*, 7; *The Falklands War: the Official History*, 22-27.

³⁹¹ *The Falklands Campaign: The Lessons*, 33.

³⁹² Copley, 52; Hastings, 88.

landing, but neither would be able to accomplish the defense of the fleet alone. The presence of the Exocet missile threat put the surface ship picket line in grave danger, and so even more pressure rested on the Harriers, and hence the carriers.³⁹³ If one of the carriers sank, Rear Admiral Forster “Sandy” Woodward could have lost his main air defense capability and hence “lost the war in an afternoon.”³⁹⁴

The original concept for ship defense was a combination of Sea Dart and Sea Wolf surface-to-air missiles with their radar and electronic suites. For economic reasons, however, the British only had available portions of the integrated air-defense architecture.³⁹⁵ Admiral Woodward, realizing the HMS *Hermes* and HMS *Invincible* were his priority, would use Harriers and distance to defend the carriers.³⁹⁶ Royal Navy leaders would consider sailing the Task Force to the west of the Falklands to decrease Harrier fuel limitations and improve their ability to intercept enemy aircraft, but no responsible officer could hazard the safety of the carriers on the as-yet unproven reliability of Sea Dart and Sea Wolf missiles, especially after the loss of the HMS *Sheffield* to an Exocet missile.³⁹⁷ The unknown reliability of the air defense missiles, combined with a lack of airborne early warning, kept the carriers well east of the Falklands, out of range from the enemy.³⁹⁸ Sir Patrick Wall, then a Member of British Parliament, would comment that if the Argentine planes had managed to sink either of the two carriers or either of the two assault ships, the landing to reclaim the islands “might never [have] taken place.”³⁹⁹

The second critical vulnerability was potential collapse of domestic political support for the Task Force. Once the Task Force had sailed, polls would show the British populace was unconvinced that the cause was worth the loss of life, and Ministers of Parliament split between belligerent enthusiasm

³⁹³ Copley, 155.

³⁹⁴ Hastings, 318.

³⁹⁵ Copley, 42-43.

³⁹⁶ Woodward recounts his thoughts on the campaign in his memoir *One Hundred Days: The Memoirs of the Falklands Battle Group Commander* (Annapolis, MD: Naval Institute Press, 1997).

³⁹⁷ Hastings, 156, 162.

³⁹⁸ Hastings, 116-117.

³⁹⁹ Copley, 109.

or outright opposition to the use of force.⁴⁰⁰ Attacks against mainland Argentina were off the political table, even though many military leaders thought such attacks would shift odds dramatically in their favor.⁴⁰¹ In addition, political pressure would eventually encourage orders from the Thatcher War Cabinet to send the landing party, despite the carrier group having not yet won sustained air superiority.

The War Cabinet's decision only emphasized the third critical vulnerability to the British campaign: the amphibious landing party and Royal Marine Brigade. This force would be at its most vulnerable while still in their assault ships and briefly after hitting the beach. The amphibious landing would represent the critical tipping point in the campaign. Once a beachhead was secure, there was probably no moment in which the Argentinian military would possess the requisite strength to overpower the British ground forces.⁴⁰² British planners preferred air superiority to protect the landing party, but denying it to the Argentinian Air Force would be the minimal requirement to get the requisite forces ashore intact.⁴⁰³

The final British critical vulnerability was the Task Force's logistics train. The Falkland Islands are "further than from London to Singapore or to Tokyo."⁴⁰⁴ It would take British shipments three to four weeks to arrive, and their rates of usage for ammunition, missiles, and anti-submarine weapons were higher than expected. Surprisingly, however, the Task Force rarely lacked essential supplies, equipment, and spares despite the tyranny of distance.⁴⁰⁵ The British enacted civilian requisition of ships through STUFT in a smooth and rapid implementation of contingency plans to support logistics and troop transport.⁴⁰⁶ These civilian vessels would prove critical as the lifeline of the Task Force, yet all were without self-defense capability and most would not receive protection until well within the theater of operations.

⁴⁰⁰ Hastings, 335., Copley, 127.

⁴⁰¹ Hastings, 162.

⁴⁰² Hastings, 321.

⁴⁰³ Copley, 154.

⁴⁰⁴ Copley, 115.

⁴⁰⁵ *The Falklands Campaign: The Lessons*, 25., Copley, 115.

⁴⁰⁶ *The Falklands Campaign: The Lessons*, 26. *The Falklands War: the Official History*, 17-18.

Lines of Effort and Decisive Points

Argentine Lines of Effort

The Argentinians had two major lines of effort: first to invade, capture, and occupy the Falkland Islands, and then to defend the islands from British military response ordered by Parliament with Air Force and Navy assets. The Argentinians would invade with marine commandos and occupy the Falkland Islands with thousands of ground troops. These ground forces received air support from Aermacchi MB-339s and FMA Pucará ground attack aircraft stationed at Port Stanley and Goose Green airfields during the occupation.⁴⁰⁷ The Argentinian junta leaders would use the ground presence to enforce their claim of sovereignty, and enact the right of self-defense.⁴⁰⁸ Aircraft operating from the Argentine mainland would attempt 445 sorties and complete 302 later, with only a few during the invasion itself and most later in defense of the islands.⁴⁰⁹ The Argentinian forces would use the threat of their air and surface-launched Exocets to help defend the island.⁴¹⁰ The invasion would catch the British off guard with only a minimal British military presence on the islands. The Argentine Air Force and Navy's next task would be to stop a British armed response.

Once a British task force sailed, the Argentine Air Force and naval defense would try to attrite British surface vessels, in particular the two aircraft carriers, and bomb any amphibious invasion planned by the British Task Force. The Argentinian Air Force would attempt this with numerical superiority in aircraft but only five AM39 Exocet anti-ship missiles, although the junta would try to purchase more.⁴¹¹ The Argentinian Air Force would learn of the Exocet's accuracy and capability during its first use: firing it at a British destroyer and sinking it quickly.⁴¹² On 4 May, an Argentine Super Étendard pilot would successfully hit the HMS Sheffield while she was on radar picket duty.⁴¹³ Overnight on 11 and 12 June, shore-launched Exocet missiles would hit the

⁴⁰⁷ Hastings, 219.

⁴⁰⁸ *The Falklands War: the Official History*, 24.

⁴⁰⁹ Hastings, 219.

⁴¹⁰ Gen Isaac, 4 Apr.

⁴¹¹ Gen Isaac, 6 Apr. Hastings, 319.

⁴¹² Gen Isaac, 6 Apr. Hastings, 115.

⁴¹³ *The Falklands Campaign: The Lessons*, 7.

HMS Glamorgan.⁴¹⁴ Beyond the limited numbers of Exocet missiles possessed by Argentina, sinking British ships otherwise required close overflight of the intended targets in order to drop unguided bombs. These limitation would not deter the AAF as they launched one mission in particular that came close to sinking the HMS Invincible. The AAF claimed on previous attempts to have identified the position of the HMS Invincible from radar tracks from their TPS-43 radar on the island and following Harrier tracks as they returned to the carriers to land. From this radar information, the AAF would deduce the arc in which the carriers were on.⁴¹⁵ On 25 May, the AAF would launch their most successful carrier hunt. Super Étendards took off armed with two Exocet missiles, flew 110nm north-northeast of the islands, and then turned south. They would eventually find one carrier group and execute their attack. The Argentine aircraft fired their Exocets while the British warships defended with chaff. Unfortunately, for the British, the civilian ship Atlantic Conveyor did not have any defenses and received hits on the port side. There is still some disagreement on whether the Argentinians hit the HMS Invincible during the attack, but the Atlantic Conveyor would sink. The British acknowledged the attack, but the Argentine Air Force would never come closer to sinking the two British aircraft carriers.⁴¹⁶ Afterward, Admiral Woodward's aircraft carriers, which were in fact sailing 70nm east of the Falklands, were seldom allowed closer than 200nm of the invasion beaches of San Carlos.⁴¹⁷ The AAF flew hundreds of sorties in defense of the islands, but it never attempted a sustained mass effort against the British carriers for reasons outlined previously.

The Argentinian military also tried to stop the British amphibious invasion and subsequent march on Port Stanley. Lack of strategic intelligence would delay their response to the critical British landing. On the morning of the amphibious landing, the Argentinian Air Force received only sparse tactical reports that the landing was taking place, which delayed any response by a

⁴¹⁴ *The Falklands Campaign: The Lessons*, 12.

⁴¹⁵ Copley, 72.

⁴¹⁶ *The Falklands War: the Official History* s, 45., *The Falklands Campaign: The Lessons*, 9., Hastings, 227-228., Copley, 72. Max Hastings describes the confusion in the attack of which ship the Argentinian pilots attacked. The Argentinian military still claims successful strikes, while the British government denies it.

⁴¹⁷ Hastings, 228.

critical two hours. The lack of Argentine mass limited defensive options once the British landing party took to their smaller beach landing craft. Their only hope lay in finding the assault group while still in their larger assault ships, thereby reducing the number of targets, but lack of landing indications eliminated this opportunity for the Argentinians.

The AAF would put up a formidable fight, however, as the British Royal Marine Brigade made its crossing of the island to assault Port Stanley. Some 80-100 sorties flew per day in attacks on British positions.⁴¹⁸ The AAF, however, could not muster the required strength to sustain the Argentine ground force's position without help from their navy.

British Lines of Effort

The British South Atlantic Task Force also had two main lines of effort. Once the British Parliament decided on a military response, the South Atlantic Task Force's initial line of effort was to gain air and sea superiority in the operations area. To achieve sea superiority, Sir John Fieldhouse, Admiral of the Royal Fleet, and Rear Admiral Woodward, the British Task Force Commander, would use two nuclear attack submarines as the primary means to counter to enemy surface ships. To achieve air superiority, they would rely on a force of destroyers and frigates, as well as Harriers launched from the carriers HMS Invincible and HMS Hermes, to combat the AAF and naval aircraft.⁴¹⁹ Twenty-eight Sea Harriers of the British Royal Navy and 14 RAF Harrier GR3s eventually deployed to the South Atlantic. At any one time during the pre-landing phase, however, the British were limited to approximately twenty Harriers. The British would turn this modest number of jets into 1,100 combat air patrols (CAPs), 90 offensive support missions, and 125 ground-attack missions.⁴²⁰ The British would also attempt to limit Argentine Air Force use of the airfield at Port Stanley through aerial attacks described previously. In the air fighting, both the Argentine aircraft and the Harriers would face severe limitations based on fuel consumption. Two tankers and a handful of aircraft capable of air-to-air refueling would support AAF aircraft flying some

⁴¹⁸ Copley, 62.

⁴¹⁹ Hastings, 114.

⁴²⁰ *The Falklands Campaign: The Lessons*, 19.

400nm one way to reach the islands. After the AAF sank the HMS Sheffield, the naval leadership of the British Task Force would move the carriers over 150nm east of the islands causing the Harriers to burn more fuel to reach the islands.⁴²¹ The AAF would focus on the British surface ships, thereby attempting to slow the invasion and eliminate the carriers. British Harriers, in turn, would attempt to destroy the AAF and gain air superiority over the Falklands. No ships in the British Task Force except the Type 22 Frigates – equipped with close-range Sea Wolf missiles – possessed an active counter to the Exocet missile threat.⁴²² Admiral Woodward would balance the need air superiority over the Falklands with the necessity to either destroy Exocet launching ships and aircraft before they could attack, or keep his carriers well clear to the east on the edge of the Harrier's fuel range.⁴²³ In the end, a combination of “just enough” air control and weather problems for the AAF would get the job done. The amphibious force sailed south under the assumption that their landing would be conducted with air superiority already won.⁴²⁴ This superiority was in question.

Second, the Task Force was then to land and protect an amphibious force to retake the islands. Admiral Fieldhouse assured Brigadier Julian Thompson, commander of the Royal Marine landing force, that the amphibious assault would not take place under air threat.⁴²⁵ The British War Cabinet would order the assault to proceed before the end of the battle for air and sea control. This order would require the carrier group to maintain distance, yet stretch Harrier capability and dispatch frigates and destroyers (intended for fleet defense) closer to the Falklands to assist in air defense.⁴²⁶ British surface ships would take losses in the process. British lack of airborne early warning or all-weather land-based aircraft would also put the amphibious assault at significant risk.⁴²⁷

⁴²¹ Hastings, 156.

⁴²² Hastings, 116.

⁴²³ Hastings, 116.

⁴²⁴ Hastings, 91.

⁴²⁵ Hastings, 94, 114. Thompson provided his own recollections in *No Picnic: 3 Commando Brigade In The South Atlantic 1982*, (London: Leo Cooper, 1992).

⁴²⁶ Hastings, 213.

⁴²⁷ *The Falklands Campaign: The Lessons*, 18-19.

Once ashore, the British landing force would quickly strive to consolidate their positions and create forward operating sites for aircraft. Almost 200 helicopters would deploy for the operation, and 90-100 helicopters and Harriers went ashore.⁴²⁸ Soon after establishing the beachhead at San Carlos, Royal Engineers constructed a forward operating base on site. Using “bellow” tanks floated at the water’s edge, and connected to mobile pumps onshore, eight men were able to hold and service eight-to-nine Harriers and conducted over 150 refueling operations during the war.⁴²⁹ This capability allowed increased productivity out of each Harrier Combat Air Patrol (CAP), allowing those with weapons remaining to land on-island, refuel, and launch for another full sortie.⁴³⁰ Basing versatility would be key in shifting the air superiority tide as the Royal Marines moved closer to Port Stanley. Another key was continual and timely interdiction missions considerably helping British paratroopers capturing Argentine held Goose Green airfield and garrison.⁴³¹ The final assault on Port Stanley would indeed come under the promised air presence guaranteed to Brigadier Thompson as Harriers and British surface ships had taken their toll on the Argentinian Air Force by this point.⁴³²

Decisive Points

There were four decisive points during the campaign that would change the balance of military power in the operations area. First, the British victories over the submarine ARA Santa Fe and the sinking of the cruiser ARA General Belgrano knocked the Argentine Navy out of the fight. At first, Admiral Woodward would regard the Argentine Navy as his most likely threat, with the most serious coming from their two modern German Type 209 submarines.⁴³³ The British Task Force would demonstrate its anti-submarine capability early. On the morning of 25 April, South Atlantic Task Force anti-submarine helicopters would pick up an unidentified radar contact close to the Argentine base at Grytviken, South Georgia. Wasp attack helicopters launched

⁴²⁸ Copley, 124., *The Falklands Campaign: The Lessons*, 20.

⁴²⁹ Copley, 62.

⁴³⁰ Copley, 62.

⁴³¹ *The Falklands Campaign: The Lessons*, 10.

⁴³² *The Falklands War: the Official History*, 35.

⁴³³ Hastings, 115.

immediately and successfully damaged the ARA Santa Fe beyond repair.⁴³⁴ Argentine submarines would continue to pose a threat, but fail to engage successfully any British Task Force ships.⁴³⁵

The other blow to the Argentine Navy was the loss of the ARA General Belgrano. On 2 May, the submarine HMS Conqueror detected the Argentine cruiser accompanied by two destroyers. Fearing an attack from the Exocet-capable surface group, the submarine engaged and sunk the cruiser with torpedoes while the latter skirted the total exclusion zone. After the sinking, and combined with the loss of the Santa Fe, the Argentine Navy retreated to port.⁴³⁶ The Royal Navy nuclear submarines played a crucial role against the Argentinian Navy and continued to provide the fleet with critical capabilities afterwards. The British submarines HMS Spartan and HMS Splendid patrolled the Argentine coast looking for ships, including the lone Argentine aircraft carrier. The submarines also patrolled near Argentina's coastal air bases and used electronic sensors to report the takeoff of aircraft sorties headed towards the Falklands.⁴³⁷ By mid-May, the British Task Force established control of the seas around the islands.⁴³⁸

The second decisive point was the British ability successfully to protect their carriers. For this campaign, the British aircraft carriers and Harrier created air superiority symbiotically. The aircraft carriers and amphibious assault party needed air parity, and moments of localized air superiority provided by the Harriers, to accomplish the landing mission. In turn, the Harriers needed the aircraft carriers to maneuver and provide a base of operations. The battle for air superiority was vital to British success in the Falklands War. The British Harriers and missile-capable ships would face 200 AAF front-line aircraft.⁴³⁹ Containment of enemy forces, defense in depth, and retaining the initiative guided maritime operations. The Task Force relied on electronic detection systems, fighter aircraft, electronic countermeasures,

⁴³⁴ Hastings, 129.

⁴³⁵ *The Falklands Campaign: The Lessons*, 7.

⁴³⁶ *The Falklands War: the Official History*, 27. *The Falklands Campaign: The Lessons*, 7.

⁴³⁷ *The Falklands Campaign: The Lessons*, 17, 22. Hastings, 157.

⁴³⁸ *The Falklands Campaign: The Lessons*, 7.

⁴³⁹ *The Falklands Campaign: The Lessons*, 20-21.

medium and short range missiles, medium caliber guns, and close range point defense systems such as “rapid firing guns and hand-held missile launchers” to defend the carriers.⁴⁴⁰ On 24 April, the carriers would rendezvous with the HMS Broadsword and HMS Brilliant, Type 42 destroyers equipped with Sea Wolf defense missiles, which acted as goalkeepers in a close escort role.⁴⁴¹ These ships would eventually establish advanced radar picket stations closest to the enemy. The British lack of airborne early warning limited their ability to detect low-flying aircraft and, combined with the threat from Exocets, pushed the carriers well east of the Falklands as previously discussed.⁴⁴²

The primary burden of fleet defense fell on the Harriers. The British Harrier pilots were able to fend off persistent and courageous attacks from the AAF, supported by resilient maintenance crews. With few Harriers available at any one time, the British continued to operate as hard as possible for as long as they could. Instead of the regular “five days on, five days off” schedule, they operated continuously to achieve an 80% serviceability rate with each Harrier averaging six 90-minute sorties each day.⁴⁴³ On their best day, the Harriers and defense ships would claim 16 aircraft shot down, a loss rate the AAF could not afford.⁴⁴⁴

The Harriers received assistance from Argentine limitations outlined previously in the COG and critical vulnerabilities section. The Argentine Air Force would only be able to sustain waves of four to eight aircraft for the anti-ship mission, and six waves per day. With quick turns of their twenty Harriers and assistance from surface destroyers, the British were able to defend against this manageable threat.⁴⁴⁵ Limited Argentine numbers of Exocets also helped.⁴⁴⁶ The British would only have to shoot down the only AAF aircraft capable of carrying and launching Exocets, Super Étendards, to negate the standoff threat. A lack of intelligence would also require the Argentine pilots to launch on missions without knowing the location of their primary target, the

⁴⁴⁰ Hastings, 116. *The Falklands Campaign: The Lessons*, 16, 20-21.

⁴⁴¹ Hastings, 83, 131.

⁴⁴² Copley, 77-79., *The Falklands Campaign: The Lessons*, 21, 35.

⁴⁴³ *The Falklands Campaign: The Lessons*, 6. Hastings, 83, 131-132, 218.

⁴⁴⁴ Hastings, 211.

⁴⁴⁵ *The Falklands War: the Official History*, 36-37. Hastings, 131-132.

⁴⁴⁶ Gen Isaac, 6 Apr.

carriers. The Argentine pilots bombed the fleet as best they could every day, hoping eventually to find the British carriers.⁴⁴⁷

The third decisive point was the British successful amphibious landing in the San Carlos region of the islands. Although unable to sustain air superiority, the British Task Force was able to use Harrier sorties, special operations forces (SOF) raids, and inclement weather to conceal and defend the landing party in their assault at San Carlos. British SOF would soften the Argentine defenses by destroying eleven Argentine ground attack aircraft on Pebble Island that could have confronted the British landing.⁴⁴⁸ The Harriers contributed by breaking up and turning back enemy attacks before the Argentine pilots could press them home.⁴⁴⁹ Poor weather would conceal the landing party dispersed among eleven landing ships. Enemy aircraft flew on the fringes of the fleet radar screens, but none ever located or engaged the ships before the landing.⁴⁵⁰

Again, Argentine limitations would aid the British at a crucial phase in the war. Poor coordination and lack of intelligence hampered the AAF commander responsible the morning of the landing, Brigadier Ernesto Crespo. The AAF did not know about the landing until 10 a.m. on 21 May, two hours after the first British landing craft hit the beaches. Even then, the AAF would only find out from their dispatched early morning sorties, launched based on little more than Crespo's initiative.⁴⁵¹ Max Hastings characterized British luck in the following way: "When [the British Task Force] had seen the power of the enemy's air force in the days that followed, they were deeply conscious of the blow that could have befallen them on 20 May. If the sun had broken through for even an hour, if the enemy had launched a series of sorties as determined as those that were to come the following day, something close to disaster could have taken over the landing force."⁴⁵² The first day after landing, Harrier CAPs

⁴⁴⁷ Gen Isaac, 8 Apr.

⁴⁴⁸ *The Falklands War: the Official History*, 33. Hastings, 194-211. *The Falklands Campaign: The Lessons*, 7.

⁴⁴⁹ Hastings, 228.

⁴⁵⁰ Hastings, 194-211.

⁴⁵¹ Hastings, 218.

⁴⁵² Hastings, 194-211.

faced 12 separate waves of Argentine aircraft involving 72 planes.⁴⁵³ Yet the chance for denying the landing had already passed. The British landed three major units of their Commando Brigade, and the 2nd and 3rd Battalions of the Parachute Regiment in a virtually unopposed landing.⁴⁵⁴

The fourth decisive point was British resupply of their landed forces. The British Task Force successfully sustained the Royal Marines while they broke out from their beachhead and marched across the island to recapture Port Stanley. With enemy positions now known, the AAF increased the intensity of its attack. Most British officers later admitted they underestimated the power of the AAF.⁴⁵⁵ To defend the beachhead the British again layered their defenses. Harriers provided the outer layer, and Type 42 destroyers armed with Sea Dart and Type 22 frigates armed with Sea Wolf missiles provided the next layer. The “gun line” was the third layer: three to four ships in the entrance to the sound using every gun and missile system available for defense. The last layer combined eight troop store ships using small caliber guns and Sea Cat missiles, with onshore defenders using Blowpipe man-portable air defense missiles, machine guns, and Rapier surface-to-air missile systems.⁴⁵⁶ As the Royal Marines marched across the island, they received support from artillery and naval bombardment while Harriers would attack flanking threats from Argentine forces at Darwin and Goose Green airfields.⁴⁵⁷ General Thompson landed 12 Rapier launchers and the Argentine pilots would note considerably worsening conditions for their attacks once Rapiers and Blowpipes were ashore.⁴⁵⁸ The Argentinian ground forces, comprised mostly of conscript troops, never counter-attacked the beachhead or the British as they marched across East Falkland.⁴⁵⁹ Finally, by the time of the final assault on Port Stanley, the AAF could not provide close air support for Argentine ground forces and the British effectively neutralized the AAF as a fighting force.⁴⁶⁰

⁴⁵³ Hastings, 194-211.

⁴⁵⁴ *The Falklands War: the Official History*, 37.

⁴⁵⁵ Hastings, 115.

⁴⁵⁶ *The Falklands Campaign: The Lessons*, 9.

⁴⁵⁷ *The Falklands War: the Official History*, 22.

⁴⁵⁸ Copley, 69., Hastings, 92.

⁴⁵⁹ Hastings, 230.

⁴⁶⁰ *The Falklands Campaign: The Lessons*, 20-21.

Intervening Variables and Assumptions

Three intervening variables and one unfounded assumption affected the campaign: Argentine international isolation, weather, and technological disadvantage, and the assumption of no significant British military response to occupation of the islands. International isolation of Argentina hampered their military. The Argentinian military never received consistent strategic intelligence, particularly satellite information from the Soviet Union, nor were the Argentine armed forces actively seeking Soviet help based on anti-communist ties with the United States. The United States officially took a neutral position on the conflict between two of its allies. Adding to the international isolation, British diplomatic pressure on the French ensured the AAF never received twenty additional Exocet missiles.⁴⁶¹ The AAF and Navy relied on tactical reconnaissance, but poor and erratic winter weather limited tactical reconnaissance effectiveness and grounded aircraft on a number of days.⁴⁶² Weather also hampered attack operation missions against the British surface fleet. Bad weather accentuated technological disadvantage. The AAF's A-4s flew with no air intercept radar, making engagement with the British forces difficult. A larger invalid assumption overshadowed some of these limitations, however.

The Argentinian junta largest assumed the British government would give up the Falklands without a fight. Admiral Jorge Anya, Commander in Chief of Argentina's Navy, thought the British had no stomach for a fight, democracies could not sustain casualties, and any Task Force ships would breakdown in the South Atlantic weather.⁴⁶³ Dr. Costa Mendes and his advisors never believed a British military response was likely, and both the Argentinians and Falkland Islanders saw the removal of the HMS Endurance as abandoning the protection of the Falklands.⁴⁶⁴ Finally, the Argentinian junta no doubt had in mind what it saw as the weakness of Britain's response to the Argentine presence on Southern Thule in 1976, which they subsequently repeated on South Georgia. The junta's members took the lack of a British

⁴⁶¹ *The Falklands Campaign: The Lessons*, 15. Gen Isaac, 6 Apr.

⁴⁶² *The Falklands War: the Official History*, 34. Gen Isaac, 8 Apr.

⁴⁶³ Hastings, 111.

⁴⁶⁴ Falkland Islands Review, 34. Hastings, 48-49.

response as an indication that it might be able to mount similar operations without provoking serious retaliation.⁴⁶⁵

The strategic British assumption was that the government would have a measure of advanced warning before any Argentine military action. The British military had contingency plans drawn up since the late 1960s, but their response predicated on advanced Argentine indicators. An expectation of graduated political pressure from the Argentinian junta, before military action, underlay all Foreign Office procedures and blinded intelligence assessments prior to the Falkland crisis.⁴⁶⁶ This assumption was dangerous given the close proximity of the Falkland Islands to Argentina, their distance from Great Britain, and the absence of any substantial British deterrent force in the area.⁴⁶⁷ These factors only multiplied in risk because the British had no coverage of Argentine movements and no evidence available to the British government from satellite photographs.⁴⁶⁸

Conclusion

The Argentine junta saw sovereignty over the British controlled islands in the South Atlantic as both achieving control over the southern link between two oceans and a boost to failing domestic political support. The Argentine end state was a negotiated settlement recognizing Argentine junta sovereignty over the Falkland Islands and South Georgia Islands. The junta would seek to speed negotiations with the British through a successful *fait accompli*. The Argentine junta used the military accomplish this through swift marine Commando occupation and joint air force and naval defense against British intervention. The junta assumed minimal British diplomatic response and hoped to strengthen their domestic position and control the south sea link between the Atlantic and Pacific Oceans. The junta failed to question their largest assumption – no British military response.

British Parliament continued negotiation through much of the conflict, but saw the Royal Navy as both the ultimate solution to the South Atlantic

⁴⁶⁵ Falkland Islands Review, 76.

⁴⁶⁶ Hastings, 42.

⁴⁶⁷ Falkland Islands Review, 76.

⁴⁶⁸ Falkland Islands Review, 73.

problem and enforcer of the Crown's credibility. The British end state was to regain physical possession and sovereignty over the islands. British military forces had to eject Argentine ground forces to achieve this end state. The Royal Navy identified four objectives to accomplish the political goal: first, create an exclusion zone around the disputed islands, second, gain air and sea superiority, third, protect an amphibious landing, and finally, defeat Argentine ground forces and recapture Port Stanley. The British government hoped this action would support the credibility of British sovereignty claims specifically in the area and around the world. In addition, senior British leaders felt an obligation to free their citizens on the islands.

The Centers of Gravity on both sides revolved around the air campaign. The Center of Gravity for Argentinian military was their numerical advantage in aircraft and proximity to their home mainland. Yet their three critical vulnerabilities to the number and proximity advantages were strategic intelligence, minimal air refueling capabilities, and a failure of joint Air Force / Navy cooperation. The Center of Gravity for the British military was the Task Force itself, which consisted of two main parts: the carrier group sent to gain and maintain air and sea superiority, and the amphibious landing party intending to eject the Argentine occupiers. The British Task Force dealt with four critical vulnerabilities: the two British aircraft carriers leading the Task Force, a potential failure of political commitment to the expedition, the vulnerability of the amphibious landing force, and the vulnerable civilian logistics train.

The South Atlantic Task Force was more successful along their lines of effort, while the Argentinians experienced several limitations to defending against the amphibious invasion. After successfully invading the islands, the Argentinian Air Force and Navy would try to defend the islands by sinking the British Task Force ships, especially the two British aircraft carriers. This task became even more challenging once the British effectively eliminated the Argentine Navy from the fighting. The AAF later tried to stop, or at least slow, the counter-invasion by attacking the British beachhead, but lost their prime opportunity when not discovering the landing party or their assault ships until the landing was well underway. As for the British, once Parliament decided on

a military response, the Task Force first attempted to gain air and sea superiority and then protect the Royal Marine amphibious landing. Poor weather, Argentine intelligence failures, and efficient use of forces available led to a successful landing in the San Carlos region of the Falklands. The British were then able to consolidate their position, use ground troops to help eliminate the air threat, and recapture Port Stanley.

The British applied an approach along the lines suggested by Corbett strategy, discussed in Introduction, when the Task Force first arrived in theater. The Harriers and ships were not robust enough to fight the Argentine Air Force head-on in a battle west of the Falkland Islands. This positioning would have left the task force too close to the Argentine mainland and open to larger massed attacks from the AAF. This vulnerability would keep the British carriers back at a safe range, where lack of re-fueling capability would limit Argentine numbers, and the task force used picket ships and Harriers to attrite the Argentinian waves that received air-refueling extension. Still operating under a Corbettian approach, the Task Force would remain active. Using submarine advantages and anti-submarine skills, the Task Force was able to sink the ARA Santa Fe and ARA General Belgrano and eliminate Argentinian Navy participation in hostilities. Argentinian Air Force limitations in intelligence and air-refueling, and limited numbers of Exocet missiles, would only help the British forces by both reducing threat numbers to the task force, and reducing the chances of interference during the decisive points of the British campaign. The AAF could launch 100 sorties in a day, but never put more than 8-12 aircraft over the island, or more than 20 against the British Fleet, at any one time.

The Argentinian military, for its part, could never bring their superior numbers to bear. To adopt fully a Mahanian approach, the AAF and Argentine Navy would have needed air refueling capability and sufficient intelligence to force a decisive battle. The British, however, were able to mass their Harriers and defenses at the right place and time to gain localized air superiority, thereby enabling their operations and ultimately the amphibious landing.

The weather also played a determining factor. Since the Argentinian military relied on tactical reconnaissance, aircraft supplied the only consistent

intelligence for the Argentine military leadership. Weather would limit not only these sorties but also limit strike sorties against the Royal Navy Fleet.

In the end, the British Task Force would accomplish their objectives only winning “air superiority” after successful Royal Marine assault landings. Up until that time, the AAF possessed the forces for potentially prohibitive interference with the amphibious assault. The initial assumption was the assault would require defeat of the AAF, but the Argentines were far from it when the Thatcher’s war cabinet gave a green light for the assault. The British Task Force, with Argentine limitations providing assistance, maintained a minimum requirement of air parity by dispersing and protecting assets and concentrating forces when needed at the decisive times. The next chapter summarizes the findings of the case studies and offers recommendations for operational planners based on them related to air superiority in the Western Pacific.



Conclusion

Determining who won or lost at the operational level is not always easy. Often such evaluations build on subjective criteria. This thesis, however, developed a framework in Chapter Two to assess who won and lost. This framework provided the means by which to determine which side accomplished the majority of its objectives and created its desired strategic effects. In the first case study, the British were able to survive the Battle of Britain and prevent a German invasion. In the second case study, the British kept Malta resupplied and benefitted from German decision not to invade the island. In the third and last case study, the British were able to recapture the Falkland, South Georgia, and the South Sandwich Islands from the Argentinians during the Falklands War. The summary of the framework and findings of this thesis are available in Appendix A.

In all three historical examples, each side desired to achieve air superiority as an enabling objective to accomplish strategic end states. During the Battle of Britain, the Germans decided air superiority was necessary to launch Operation Sea Lion. British leaders, however, knew that retaining air superiority, or at least maintaining air parity, was necessary to prevent the German invasion. During the siege of Malta, the Germans again decided that air superiority was a necessary precondition for invading the island. British leaders within Middle East Command desired air superiority to protect resupply of Malta, deter a German/Italian invasion, and saw it as the necessary prior step to interdict Axis supply lines flowing into North Africa. During the Falklands War, the Argentinians needed air and sea superiority to defend the islands after their initial capture, while the British would set air superiority as a necessary condition to launch the amphibious landing to retake the Falklands.

Although believed necessary to accomplish objectives, air superiority actually acquired was fleeting. In two of the three cases, the British desired air superiority to enable follow-on missions yet they were only able to achieve air parity operationally. The RAF on Malta lost air parity but still managed to achieve their operational objective.

The differences between desired air superiority as an air control level to accomplish follow-on objectives and actual levels of air control hinge on time and space. As referenced in doctrine, and discussed in the introduction, air superiority not only refers to prevention of enemy interference in operations, but prevention defined in time and space. Communicating bounded time and space, as ambiguous ideas, through doctrine, however, is difficult. Conditioning of the mind from recent conflicts in the Middle East imply larger geographical spaces and longer periods, that border on air supremacy ideas of air control. In each of the historical cases, ideas of time and space exceeded limited mission specific time lengths and locations. For instance, the Germans believed larger areas and longer periods of air superiority were required to launch the invasion of southern England, but the British Task Force in the Falklands War launched their amphibious assault under air superiority lasting half a day and only over the north side of the Falkland Islands. To assist in bounding time and space ideas, this conclusion refers to air superiority desires of large areas, such as the southern part of England or over complete sets of islands, for periods covering a few days as operational air superiority; and air superiority over the area covered by an air formation, or package, for the duration of a few missions as tactical air superiority.

The case study findings suggest a reevaluation of the perceived necessity of operational air superiority. The Introduction defined air superiority as a degree of air control obtained by one side that permits the conduct of operations without “prohibitive interference” from threats.⁴⁶⁹ Air parity, however, is a condition where neither side has control of the air, and friendly forces may encounter significant interference by the opposing force.⁴⁷⁰ The difference between prohibitive and significant interference is not the distinguishing feature between the two levels of air control. With air superiority, the opposing side may try to offer significant interference, but is unable to achieve a level of interference that would prohibit friendly operations. Air parity on the other hand, exists when each side may launch forces to interfere prohibitively with the other’s operation.

⁴⁶⁹ “Countering Air and Missile Threats,” *Joint Publication 3-01*, (Washington D.C.: March 2012).

⁴⁷⁰ JP 3-01.

Operational air parity existed for a majority of the time in the three examples. Both the Luftwaffe and the RAF significantly interfered with the other side's mission during the Battle of Britain. The British goal was this interference while denying the Luftwaffe follow-on objectives, namely the invasion. The Germans worried about the prohibitive interference the British could apply to transport ships from the air. The British could not launch offensive operations to destroy the Luftwaffe and therefore operational air parity existed.

During the siege of Malta, every time the RAF flew, its forces met with significant interference. On the Axis side, however, the Luftwaffe achieved a period at the end of 1942, in which its forces met with no RAF prohibitive interference. As a result, the Luftwaffe attained operational air superiority in that brief period.

Air parity existed at the operational level during the Falklands War. The Argentinians maintained a capability to interfere significantly with the British surface protection and landing objectives despite their losses. British surface ships and Harriers significantly interfered with Argentinian attempts to sink their aircraft carriers. To sum up, operational air parity was the norm in all three case studies, save for a month-long span of German/Italian operational air superiority during the siege of Malta. Even though operational air parity existed in all three cases, save for the exception of a single month, one side in each case was indeed able to accomplish its objectives.

The case studies also suggest air control conditions change at the different levels of war temporally. A state of air parity can exist at the operational level in the conflict while one side can obtain air superiority at the tactical level. During a period, anywhere from minutes to hours, a belligerent can achieve the "without prohibitive interference" condition even though operational air control may be contested.

This condition is possible for at least one reason suggested in military theory, and translated to doctrine. The first reason is the principle of war of massing one's forces at the decisive point.⁴⁷¹ Baron Antoine-Henri Jomini

⁴⁷¹ Air Force doctrine describes this principle in Basic Doctrine Vol 1 – Chapter 4: The Principles of Joint Doctrine – Mass.

identified this principle of war as the singularly most fundamental in his work *The Art of War*. He wrote, “throw by strategic movements the mass of an army, successively, upon the decisive points of a theater of war,” and “on the battlefield, to throw the mass of one's forces upon the decisive point.”⁴⁷² The implication of Jomini's principle is that one side need not outnumber enemy forces everywhere continuously. The same enemy, however, might enjoy enough forces to generate and mass enough aircraft to gain a significant numerical advantage for a limited time at the decisive point. This mass is one reason why the *initiative* advantage goes to the force on the offensive. The attacker chooses the time, as well as the location, when forces mass against the decisive point. This initiative results in one side knowing when to mass his forces. If one side has sufficient numbers, they can repel a massed adversary and prevent prohibitive interference at all times. In this case, an adversary possesses air superiority at all times, or air supremacy. If an adversary is able to mass and prohibitively interfere with friendly massed operations then operational air parity exists.

In all three case studies, the side that accomplished its strategic objectives was numerically inferior. How did they win without gaining and maintaining operational air superiority? The following paragraphs answer this question and the next section moves takes its implication into the strategic dilemma confronting the U.S. in the Western Pacific.

In all three cases the British succeeded by denying operational air superiority to the adversary through air parity while obtaining tactical air superiority at the decisive point. If one side has operational air superiority, then tactical air superiority should be a given. If the numerically inferior belligerent can at least maintain operational air parity in the air control spectrum and gain tactical air superiority at the decisive point, it may still succeed.

The British in all three cases were numerically inferior, but still able to gain tactical air superiority at the decisive point. Their opponents should have massed their numerical superiority at the decisive point as well, but either

⁴⁷² Antoine-Henri Jomini, *The Art of War*, trans. G.H. Mendell and W.P. Craighill (New York: Dover Publications, 2007), 63.

chose not to or were incapable of doing so. At the tactical level then, there are additional factors to air superiority than the numbers balance.⁴⁷³

The factors contributing to tactical air superiority at the decisive point may be outside of one's direct control. For example, the British used the cover of bad weather and a lack of Argentine strategic intelligence resources in the Falklands War to obtain localized air superiority during the amphibious landing with their Harriers. The RAF achieved tactical air superiority during the Battle of Britain because the invasion never happened. The *threat* of significant interference posed by British operational air parity sufficiently deterred the German invasion and pre-empted the tactical air superiority need. During the Siege of Malta, the Middle East Command, and more precisely RAF forces on Malta, would never have obtained tactical air superiority during a proposed German/Italian amphibious assault on Malta because the Luftwaffe actually obtained air supremacy. Middle East Command, however, did achieve tactical air superiority at the decisive point indirectly as the invasion never took place. The most senior German leaders failed to recognize the critical need to invade Malta to assure their supply lines. They had the false belief of the ability of the Italians to suppress Malta for the duration of the war. In addition, Hitler had a hangover effect from last German attempt to invade an island, Crete. The losses the Germans incurred during that invasion, combined with competing priorities for the Luftwaffe elsewhere, stopped operational plans for invasion cold.

The factors that contributed to British tactical air superiority were not greater numbers or more advanced technology, but rather the effects of weather, intelligence, and deception. In its most recent conflicts, the US Air Force and its coalition partners have enjoyed operational air superiority, if not air supremacy. The US and its allies, however, may not enjoy numerical or even technological advantages in the Western Pacific. For these reasons, the US Air Force should reconsider the bounded time and space concepts associated with air superiority.

⁴⁷³ One of the primary techniques for the USAF to compensate for numbers has been superior technology. For instance, the F-22 is calculated to be able to handle four to five fourth generation fighter aircraft. In the WPTO however, technological advantage is quickly diminishing. The historical cases offer other factors.

Maintaining operational air parity, and the capability to mass for tactical air superiority, is more than just a function of the weather, intelligence, deception. Force survival is necessary as well. The British used several tactical defensive techniques that allowed their forces to survive. While many of these techniques already appear in our air base defense tactics, techniques, and procedures (TTPs) rarely are they ever considered or tested in exercises. Alan J. Vick points out the USAF's tactical complacency in a RAND report. He argues, "Since the end of the Cold War, U.S. dominance in conventional power projection has allowed U.S. air forces to operate from sanctuary, [mostly] free from enemy attack. This [dominance] led to a reduced emphasis on air base defense measures and the misperception that sanctuary was the normal state of affairs rather than an aberration."⁴⁷⁴ Vick also suggests the USAF should renew its interest in the "neglected topics" of base hardening, dispersal, camouflage, deception, and air base recovery and repair.⁴⁷⁵

In the case studies, the British used several techniques to protect the aircraft on the ground when they were their most vulnerable. In the Falklands War, the British employed early warning sensors and maneuver. For example, the British Task Force deployed radar picket ships with air defense armament to protect the carriers in addition to moving the carriers to a safe distance to the east of the Falkland Islands to ensure their safety. During the Battle of Britain, the RAF dispersed its available aircraft to multiple airfields and could land and rearm/refuel even when their home base was under attack or damaged heavily. Even on the tiny island of Malta, RAF leaders were able to create multiple dispersal points on the airfields and connect them to multiple runways with an ever-increasing system of taxiways.⁴⁷⁶

To conclude this section, the findings of this thesis on air superiority given numerical inferiority summarize into three prescriptive principles. First, at a minimum maintain operational air parity and use massed aircraft at the decisive point to gain temporary tactical air superiority. Doctrine already

⁴⁷⁴ Vick, Alan J., "Air Base Attacks and Defensive Counters: Historical Lessons and Future Challenges, Santa Monica, Calif.: RAND Corporation, RR-968-AF, 2015, xi.

⁴⁷⁵ Vick, xi.

⁴⁷⁶ Elliot, Peter. *The Cross and the Ensign: A Naval History of Malta 1798-1979*, (Annapolis: Naval Institute Press, 1980), 130.

codifies this fact, however operational planners should be able to bound better their ideas on time and space for air superiority from looking at the historical cases. Second, use weather, intelligence, and deception to balance the enemy numbers faced at the decisive point by friendly air forces.⁴⁷⁷ Finally, use dispersal, intelligence, and air base defense measures to protect numerically inferior air forces while they wait for the decisive point(s) in the campaign.

Connections to Theory

The hypothesis at the beginning of this thesis was for the US to consider an approach to air superiority doctrine in the Western Pacific Theater through the lens of the ideas of Julian Corbett. The assumption behind this hypothesis was air superiority is a necessary precondition for follow-on operations in future major conflicts in the theater, but bounded by smaller requirements in time and space than have recently been enjoyed. This hypothesis stands in contrast to Alfred Mahan's notion of command of the domain denoted in this analysis as operational air superiority.

For the British military forces in each of the three case studies a Mahanian approach, to engage the enemy fleet in decisive battle, was infeasible as they were at a significant numerical disadvantage. The British forces instead had to survive attacks and hopefully then mass enough numbers, assisted with the "other factors" that affect tactical air superiority identified above, when the decisive point arrived.

Julian Corbett also saw command of the domain as desirable but difficult to achieve. He added if command of the sea is not possible, at a minimum friendly forces should prevent the enemy from obtaining it.⁴⁷⁸ Corbett's preventative vision foresees moments of friendly tactical superiority, which is evident in the case studies. These case studies suggest the enemy cannot retain operational air superiority if tactical air superiority remains contested. The command of the air instead is in dispute during those moments.

⁴⁷⁷ Air Force doctrine describes this principle in Basic Doctrine Vol 1 – Chapter 4: The Principles of Joint Doctrine – Surprise. However, the doctrine implies surprise as a given derived from obtaining the initiative. Surprise is not a given. Deception, weather, and faulty enemy intelligence enabled surprise for air power in the three cases.

⁴⁷⁸ Corbett, Julian S. *Some Principles of Maritime Strategy*, ed. John B. Hattendorf and Wayne P. Hughes (Annapolis: Naval Institute Press, 1988), 91.

The RAF was strategically successful by contesting tactical air superiority against numerically superior opponents in the Battle of Britain and the Falklands War. Air parity provided enough air control to deter the German invasion during the Battle of Britain. Air Marshal Keith Park would prove massing to repel the German attacks was not required but disrupting and challenging Luftwaffe operations, and providing significant interference, was sufficient. During the Falklands War, the tactical requirement for offensive air superiority was only required for the amphibious landing, and the British Task Force, combined with weather, intelligence and deception, was able to provide it.

Corbett goes on to describe options for “the fleet” if even these levels of operation are not available. The purpose of his “fleet in being” was to “hold the command in dispute; that is, we endeavor by active defense operations to prevent the enemy either securing or exercising control for the objects he has in view.”⁴⁷⁹ The RAF on Malta was seeking to retain the ability to dispute command of the air. As long as the RAF survived, and offered a minimal active threat to Axis supply lines, it would dispute command of the air and sea in the Central Mediterranean. German and Italian air attacks pushed the RAF to the brink by seeking to achieve decisive command. Axis attacks devastated British forces by late April 1942 to the point that the Axis effectively destroyed the British air “fleet.” As the ground invasion never took place to close Valetta harbor, the British were able to reconstitute “the fleet” when *Luftwaffe* forces were transferred to other theaters. This reconstitution allowed the RAF to continue one of its primary objectives: attack Axis convoys and create logistical problems for the *Afrika Korps* in Northern Africa.

The British adopted a Corbettian approach to force survival in all three case studies. Corbett saw concentration as, “the possibility of massing at the right time and place. It meant the disposal of squadrons about a strategical [center] from which fleets could condense for massed action in any required direction, and upon which they could fall back when unduly pressed.”⁴⁸⁰ As described earlier, the British would effectively attempt dispersal and defensive

⁴⁷⁹ Corbett, 165.

⁴⁸⁰ Corbett, 144.

measures in all three cases. Yet different British commanders were keen to be able to concentrate their inferior numbers at the decisive point.⁴⁸¹

A key enabler evident in all three cases studies for dispersal and concentration in the air domain is intelligence. Fighter Command used the chain of radar stations and observers to identify Luftwaffe attacks and used sector stations to disseminate that information rapidly during the Battle of Britain. The German leadership would use Italian radio intelligence for two reasons. First, the Germans were able to determine when British convoys launched for Malta to resupply forces on the island. Second, German leaders were able to identify patterns in British aircraft concentration in order to time their own attacks and counterattacks. The British Task Force in the South Atlantic during the Falklands War supplanted its lack of airborne early warning by placing submarines off the coast of Argentina to inform them of when AAF attack waves were launching. Given its importance in all three case studies, strategic intelligence and access to it will be no less necessary in a future conflict in the Western Pacific.

Recommendations

Strategic

In a general sense, the United States Pacific Air Forces should look to Corbett's writings to gain insight for fighting the first few weeks of a conflict with China. At the outset of hostilities in a potential conflict with China, US air assets will be dispersed in engagements around the globe. Without strategic indicators tipping off a potential US coalition to shift forces in theater, friendly air assets will be at a numerical disadvantage initially. Coalition air forces seek decisive battle to win strategic air superiority along the ideas of Mahan, and current Air Force doctrine, until the United States and other allies can bring additional air forces into the Western Pacific Theater. Defensive layers will be necessary to protect forward assets in theater and should consider taking a page from Air Marshal Park's playbook in the Battle of Britain: launch alert fighters to delay and disrupt attacks. A massed battle against a numerically

⁴⁸¹ Air Force doctrine describes this principle in Basic Doctrine Vol 1 – Chapter 4: The Principles of Joint Doctrine – Concentration.

and potentially technologically superior Chinese force carries the risk of losing significant numbers of aircraft in theater. The initial approach for US and coalition forces should be to survive and disperse until they can concentrate at the right time and the right place, or the decisive point, to win tactical air superiority. A combination offensively of weather and deception, and defensively with intelligence and deception can offset inferiority of numbers. The other critical function for planners is to first identify the decisive point and then mass sufficient forces upon it.

More specifically, the defense will most likely be the first line of effort in a scenario in the East China Sea. Concentration at the decisive point does not necessarily mean concentrating for an enemy attack on a forward base such as Kadena Air Base. Coalition planners may only allow a Chinese attack on Kadena to be a decisive point if the planners fail adequately to defend it. The findings in this thesis suggest a defensive plan cannot and should not waste its forces to try to prevent a Chinese onslaught. Disrupting a Chinese attack will be important, but layered defenses, passive air base defenses, dispersal, and rapid repair will balance against the enemy attack and offset numerical inferiority. Air Force Doctrine, air base defense TTPs, and RAND report recommendations discussed previously all offer coalition forces additional options to defend at the operational and tactical level. Survival at the strategic level by disputing air control and achieving air parity should be the primary objective. The decisive point to concentrate in this scenario is an amphibious invasion as the three case studies suggest. A Chinese amphibious invasion could occur in the form of assault against islands in the East China Sea or attempts at a blockade. Coalition planners can only prevail in this potential scenario if they have assets that survive until they can concentrate against the decisive point *after* the massive opening strike.

In a scenario in the South China Sea, US and coalition forces will again need to disperse. The decisive point in this context will be the US and coalition ability to mass for attacks against reclaimed Chinese islands or forces that have closed the South China Sea. Weather and deception will assist in offsetting numerical inferiority at the tactical level as well. In a scenario where China chooses to “close” the South China Sea to traffic, maintaining an air “fleet in

being” and operating with it in the region achieves necessary strategic objectives. The Chinese will fail to close the South China Sea if our forces still threaten to operate.

Tactical

At the tactical level, the USAF should offset its numerical disadvantage against the Chinese with three improvements. First, coalition air forces need to improve their all-weather flight capability and ensure their pilots training for it. Poor weather effectiveness could be a significant advantage as most air forces possess all-weather aircraft yet do not train to the conditions. Second, intelligence, surveillance, and reconnaissance (ISR) infrastructure should be redundant to provide information necessary to disperse and concentrate. In defensive operations, coalition aircraft cannot mass for the decisive point if they cannot identify it. Finally, re-learning the importance of deception can assist in preserving the numbers of coalition aircraft to concentrate at the decisive point in offensive operations.

Concentration at the Decisive Point

Layered defenses and survival techniques are necessary but insufficient to accomplish the second half of Corbett’s ideas on concentration after dispersal. At present, US forces are concentrated in large forward bases, which provide lucrative targets for Chinese forces. Large forward operating bases make logistics and maintenance easier to consolidate, eliminate redundancies and above all else, are cheaper to maintain than numerous, distributed bases. Multiple bases and operating locations require the support infrastructure associated with a main air base. Given current and future budget realities, the United States is unlikely to develop or maintain multiple basing locations in the Western Pacific.

Two potential solutions to address the forward basing problem are coalition/commercial basing and the Rapid Raptor concept. Air planners should leverage the commercial capabilities of civilian airport infrastructure in

the region and possibly look for Japanese basing assistance. This strategy includes looking at potential capabilities for aircraft to operate on the civilian standard petroleum, oil, lubricant (POL) and fuel. The armament required to re-arm aircraft would not be available at civilian airports, which leads to the second solution, the Rapid Raptor concept.⁴⁸² The basic idea behind the Rapid Raptor concept is using C-17's, loaded with the needed small package maintenance personnel and munitions required, to land and re-arm F-22's at these other than military locations. This concept provides a capability for aircraft to be "turned" (refueled and rearmed) so they may be available quickly after dispersing. It allows the quick reconstitution of air assets after dispersal, thereby achieving concentration at the decisive point if it occurs immediately after a dispersal due to Chinese attack. Rapid Raptor also allows a means for ground personnel to turn aircraft in locations in which a coalition faces impediments to permanently positioning personnel, which include political and fiscal restraints, among others. This concept should not remain specific to just the F-22 and other USAF and sister-service fighter assets can use similar variations on the overall concept. Changes in basing, operations, and approaches to warfighting may turn seemingly overwhelming odds in the Western Pacific into our favor.

⁴⁸² This concept stems from Forward Area Re-fueling Procedures (FARP) conducted currently by SOF. For detailed information on the Rapid Raptor concept, please see Colonel Robert Davis' Air War College paper - FIGHTER FARP: AN AFFORDABLE AND FEASIBLE CONCEPT FOR POWER PROJECTION IN AN ANTI-ACCESS ENVIRONMENT (April, 2014).

Appendix A

Operational Design Framework and Findings

	Battle Of Britain		WWII Siege of Malta		Falklands War	
	German	British	German/Italian	British	Argentine	British
End State / Objectives / Effects	- Gain air superiority to make the threat of invasion credible. Force British negotiations	- Maintain a minimum of Air Parity and deny air superiority to Germans to prevent invasion	- Gain air superiority to suppress Malta's offensive capabilities and open option for invasion. Protect Mediterranean supply lines	- Maintain air parity, or temporary air superiority, to enable Island resupply and offensive Axis convoy attack.	- <i>Fait accompli</i> and negotiated settlement recognizing Argentine sovereignty over the Falkland Islands by quickly landing marines. Gain strategic positioning in the South Atlantic and boost domestic political support.	- Fulfill duty to defend British protectorate by regaining possession of the islands with a Naval task force. Gain local air and sea superiority followed by an amphibious invasion.
COGs / Critical Vulnerabilities	COG - Numerical superiority and initiative. CV - time, intelligence, targeting	COG - Fighter CMD and the C2/Intel sharing "Dowding System". CV - Radar and Sector stations providing C2/Intel	COG - Numerical and qualitative superiority in opening stages. CV - time, priorities for air forces	COG - Resilience of Malta as a base of operations, and quick reconstitution. CV - Vulnerable supply lines to the island	COG - numerical superiority and proximity to the operational area. CV - strategic intelligence and air refueling	COG - The British task force. CV - British carriers, political commitment, amphibious landing party, logistics lines

LOEs / Decisive Points	LOE - Multiple due to five separate targeting changes. DP - Lack of focused effort on COG due to strategic intelligence failures and leadership indecision/mis-prioritization. Culminating in change of target from Fighter Command to London	LOE - Attrite German numerical advantage and preserve ground organization. DP - Preservation of forces until German shift in strategy to London bombing	LOE - Direct attack on British CVs (forces on island and resupply). DP - decision not to invade to seal victory	LOE - Survive and resupply forces on-island, cause Axis attrition when forces allowed. DP - Hitler moves Luftwaffe to other theaters	LOE - invade and capture the Falkland Islands, then defend the islands through maintenance of air and sea superiority around the islands - provided jointly by the Argentine Navy and AF	LOE - Gain air and sea superiority around the islands, land and defend the amphibious assault party, re-capture Port Stanley. DP - 1) sinking of Santa Fe and General Belgrano, 2) Successful protection of the British carriers, 3) successful British amphibious landing, 4) successful resupply of British forces
Arrng. Of Ops / Intervening Variables / Assumptions	- German Leadership would never understand from intelligence the COG for the British Defenses	- Park vindicated in "attrition in the air" vs. "attrition on the ground."	- Excellent Italian intelligence found British forces and convoys resupplying Malta; hangover from Operation Mercury (German airborne invasion of Crete); and suppression of British forces deemed sufficient	- Ability to reconstitute Malta at key moments, and the survivability of forces on island with preparations to the airfields - The British realized the need and benefits of air superiority	- International isolation of Argentina resulting in low assistance levels in arms and intelligence. - Bad weather limited Argentine ability to mass and find both the British carriers and assault party	- Cognitive dissonance in believing the Argentinians would invade the Falkland Islands. - British assumption of warning signs for an invasion of the Falkland Islands

Conclusion - Theory Impact	<p>- Survival of The RAF (British air fleet) maintained air parity in The air control scale, and denied German follow-on objectives - amphibious invasion. The British, while defending the home island during the Battle of Britain, were able to disperse and concentrate forces efficiently. This ability led to survival when needed, and denying the Germans the air superiority needed to conduct an invasion.</p>	<p>- Malta acted as the "fleet in being," as long as Malta survived as a British operational base Axis forces were needed to suppress Malta's capabilities. The Germans never invaded to wipe out Malta's "fleet in being." Hence, when not suppressed, Malta acted as a significant launch platform for attacks on the German Africa Corps. These attacks would cause terrible logistics problems for Rommel.</p>	<p>- The Argentine Air Force was never able to mass against the British task force to have the desired decisive battle, in which they would hold a numerical advantage. The British would use this Argentine deficiency, poor Argentine strategic intel, and inclement weather, to ensure local sea and air superiority when needed at decisive points during the war.</p>
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